

2016 OU2 GROUNDWATER INVESTIGATION  
RE129D1, RE129D2 (VPB163)  
INSTALLATION REPORT

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)  
SITE 1 OU2  
BETHPAGE, NY

Prepared for:



Department of the Navy  
Naval Facilities Engineering Command, Atlantic  
9324 Virginia Avenue  
Building Z-144  
Norfolk, Virginia 23511

**December** 2016

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Norfolk, Virginia 23511

Prepared by:



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Contract Number: N62470-11-D-8013  
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**December** 2016

*Brian Caldwell*

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Brian Caldwell  
Contract Task Order Manager

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## List of Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
COR	Continuously Operating Reference
DOD	Department of Defense
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency, United States
ft	feet
GOCO	Government-Owned Contractor-Operated
GPS	Global Positioning System
IDW	Investigation Derived Waste
IR	Installation Restoration
Katahdin	Katahdin Analytical Services
NAD	North American Datum
NAVD	North American Vertical Datum
NAVFAC	Naval Facilities Engineering Command
NG	Northrop Grumman
NTU	nephelometric turbidity units
NWIRP	Naval Weapons Industrial Reserve Plant
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethene
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment
PVC	Polyvinylchloride
SAP	Sampling and Analysis Plan
SVOC	Semivolatile Organic Compounds
TCE	Trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
UFP	United Federal Programs
US	United States
VOC	Volatile Organic Compounds
VPB	Vertical Profile Boring

## 1.0 PROJECT BACKGROUND

Resolution Consultants has prepared this Data Summary Report for the Naval Facilities Engineering Command (NAVFAC), Mid-Atlantic under contract task order WE15 Contract N62470-11-D-8013. This report describes the installation of two monitoring wells and one initial groundwater monitoring event (specifically at the Vertical Profile Boring [VPB] 163 location) in 2016 for the Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage Operable Unit (OU) 2 Site 1 offsite plume. NWIRP Bethpage is located in east-central Nassau County, Long Island, New York, approximately 30 miles east of New York City (Figure 1).

### 1.1 Scope and Objectives

This report provides information on the installation of RE129D1 and RE129D2. The purpose of this investigation was to ascertain subsurface conditions and contaminant levels and the western extent of the offsite plume south of Hempstead Turnpike and west of Seaman's Neck Road. The locations of RE129D1 and RE129D2, as well as other VPBs and monitoring well locations, are shown in Figure 2.

The field investigation included completing two monitoring wells, well development, soil/groundwater analysis, groundwater grab samples, and surveying. Field tasks were conducted in 2016 in accordance with the *United Federal Programs Sampling and Analysis Plan (UFP SAP)*, Bethpage, New York (Resolution, 2013a). In addition, the work adhered to the following UFP SAP Addendums: *Groundwater Sampling Using Low Stress (Low Flow) Purging and Sampling Protocol* (Resolution Consultants, 2013b) and *Installation of Vertical Profile Borings and Monitoring Wells* (Resolution Consultants, 2013c).

Documentation of these activities is included in Appendix A of this report.

### 1.2 Site History

NWIRP Bethpage is in the Hamlet of Bethpage, Town of Oyster Bay, New York. Since its inception in 1941, the plant's primary mission was the research, prototyping, testing, design, engineering, fabrication, and primary assembly of military aircraft. The facilities at NWIRP included four plants used for assembly and prototype testing, a group of quality control laboratories, two warehouse complexes (north and south), a salvage storage area, water recharge basins, the Industrial Wastewater Treatment Plant, and several smaller support buildings.

The Navy's property originally totaled 109.5 acres and was formerly a Government-Owned Contractor-Operated (GOCO) facility that was operated by Northrop Grumman (NG) until September 1998. Prior to 2002, the NWIRP property was bordered on the north, west, and south by current or former NG facilities, and on the east by a residential neighborhood. By March 2008, approximately 100 acres of NWIRP property were transferred to Nassau County in three separate actions. The remaining 9 acres and access easements were retained by the Navy to continue remedial efforts at Installation Restoration (IR) Site 1 – Former Drum Marshalling Area and Site 4 – Former Underground Storage Tanks (Area of Concern [AOC] 22). A parcel of land connecting the two sites was also retained. Currently, the 9-acre parcel of NWIRP is bordered on the east by the residential neighborhood and on the north, south, and west by Steel Equities; however, a small portion is still owned by Nassau County. Access to the NWIRP is from South Oyster Bay Road.

### 1.3 Geology and Hydrogeology

Overburden at the site consists of well over 1,000 feet (ft) of unconsolidated deposits overlying crystalline bedrock of the Hartland Formation. Overburden is divided into four geologic units: the upper Pleistocene deposits, the Magothy Formation, the clay member of the Raritan Formation ("Raritan Clay") and the Lloyd Sand member of the Raritan Formation ("Lloyd Sand") (Geraghty and Miller, 1994).

The upper Pleistocene ranges in thickness from approximately 50 to 100 ft and consists of till and outwash deposits of medium to coarse sand and gravel with lenses of fine sand, silt and clay (Smolensky and Feldman, 1990); these deposits form the Upper Glacial Aquifer. Directly underlying this unit is the Magothy Formation with a thickness of 650 to 900 ft and lower extent of 700 to 1,000 ft below ground surface (bgs), as observed at the former NWIRP and extending southeast to areas south of Southern State Parkway. Locally at the RE129 locations, the bottom of the Magothy (top of the Raritan Clay) is encountered at approximately 973 feet bgs. The Magothy is characterized by fine to medium sands and silts interbedded with zones of clays, silty sands and sandy clays. Sand and gravel lenses are found in some areas between depths of 600 and 880 ft bgs; these deposits form the main producing zones of the Magothy Aquifer.

Investigations performed by the Navy since 2012 indicate that the bottom of the Magothy (top of the Raritan Clay) can extend to depths of 700 to greater than 1,000 ft bgs. The top of the Raritan Clay deepens to the south-southeast, as evidenced by clay depths of 1,000 ft bgs (or more) in borings installed offsite. The Raritan Clay Unit is of continental origin and consists of clay, silty clay, clayey silt, and fine silty sand. This member acts as a confining layer over the Lloyd Sand Unit. The Lloyd Sand Unit is also of continental origin, having been deposited in a large fresh water lacustrine

environment. The material consists of fine to coarse-grained sands, gravel, inter-bedded clay, and silty sand. These deposits form the Lloyd Aquifer.

The Upper Glacial Aquifer and the Magothy Aquifer comprise the aquifers of interest at the NWIRP. Regionally, these formations are generally considered to form a common, interconnected aquifer as the coarse nature of each unit near their contact and the lack of any regionally confining clay unit allows for the unrestricted flow of groundwater between the formations.

The Magothy Aquifer is the major source of public water in Nassau County. The most productive water bearing zones are the discontinuous lenses of sand and gravel that occur within the siltier matrix. The major water-bearing zones are coarse sand and gravel lenses located in the lower portion of the Magothy. The Magothy Aquifer is commonly regarded to function overall as an unconfined aquifer at shallow depths and a confined aquifer at deeper depths. The drilling program at the NWIRP has revealed that clay zones beneath the facility are common but laterally discontinuous. No confining clay units of facility-wide extent have been encountered. This is also the case for borings installed offsite.

Groundwater is encountered at a depth of approximately 50 ft bgs at the facility. Historically, because of pumping and recharge at the facility, groundwater depths have been measured to range from 40 to 60 ft bgs. The groundwater flow in the area is to the south-southeast.



## 2.0 FIELD PROGRAM

Two monitoring wells were installed in the vicinity of VPB163 between February 2016 and April 2016. Field investigation activities consisted of drilling, well installation, well development, sampling, soil/groundwater analysis, and surveying. Drilling during this investigation was performed by Delta Well and Pump Company of Ronkonkoma, New York. A description of these tasks is provided below.

### 2.1 Drilling and Well Construction

Monitoring wells RE129D1 and RE129D2 were installed using mud rotary drilling techniques (Figure 2). Depths of monitoring wells RE129D1 and RE129D2 were 715 ft and 830 ft respectively. Well construction details are summarized in Table 1. Boring logs with lithologic descriptions of the well screen interval are included in the Appendix A. *2015-2016 OU2 Groundwater Investigation VPB163* (Resolution Consultants, 2016) documents the installation of this VPB including detailed lithologic descriptions, continuous gamma plot and multiple Volatile Organic Compounds (VOC) sample results over the entire boring length.

Three groundwater grab samples were collected while drilling RE129D2 since the samples collected at the paired VPB (VPB163) at 278, 298 and 318 ft bgs were not analyzed due to lab error. Groundwater grab samples were collected with a hydropunch sampler and analyzed for VOCs using Environmental Protection Agency (EPA) Method 8260C. The groundwater grab samples were analyzed by Katahdin Analytical Services (Katahdin), a Department of Defense (DoD), Environmental Laboratory Accreditation Program (ELAP), and New York State Department of Environmental Conservation (NYSDEC)-certified laboratory. During the collection of groundwater grab samples, field parameters were measured (pH, temperature, specific conductivity, oxidation reduction potential, dissolved oxygen, and turbidity). Data validation was performed by Resolution Consultants. Groundwater grab sample logs, data validation packages, and analytical data tables are included in Appendix A.

Prior to installing each monitoring well, the results of the groundwater samples, the geophysical logs, lithology and field data from the vertical profile borings were analyzed (*2015-2016 OU2 Groundwater Investigation VPB163*, Resolution Consultants, 2016). Screen intervals were determined based on intervals with the highest VOC concentrations as measured in the hydropunch samples and coincident intervals with the highest apparent permeability based on the gamma logs. During the monitoring well installation, split spoon samples were collected every 5 ft in the screen interval. One soil sample per monitoring well was analyzed for Total Organic Carbon (TOC) via

United States (US) EPA series SW-846 method 9060A by Katahdin. Data validation of TOC data was performed by Resolution Consultants. Data validation packages and analytical data tables are included in Appendix A.

Wells were constructed of 4-inch diameter, Schedule 80, National Sanitation Foundation-approved polyvinylchloride (PVC) riser pipe and .010-slot well screen. Wells were completed at the surface with a 12-inch diameter steel curb box. Well risers were set below grade and fit with lockable J plugs. Detailed monitoring well construction diagrams are included in Appendix A.

## 2.2 Well Development

Following installation, all monitoring wells were developed to evacuate silts and other fine-grained materials and to establish the filter pack to promote a hydraulic connection between the well and the surrounding aquifer. Well development was not initiated until at least 24 hours after well installation.

Monitoring well screens were developed using a combination of air lifting, manual surging, and pumping with a submersible pump. Turbidity was monitored during development to determine stabilization. In compliance with NYSDEC policy, wells were developed until turbidity was less than 50 nephelometric turbidity units (NTUs) if possible. Table 2 summarizes total pumped volume from air and pump development and final turbidity. Well development logs are included in Appendix A.

## 2.3 Sampling

Following development, wells were allowed to stabilize for at least 2 weeks prior to groundwater sampling in accordance with low flow sampling procedures. Wells were purged using a bladder pump with a drop tube intake placed at the approximate midpoint of the screened interval. The following water quality parameters were continuously measured: water temperature, pH, conductivity, oxidation-reduction potential, dissolved oxygen and turbidity. Groundwater analytical samples were collected when water quality parameters stabilized. Samples were analyzed for VOCs via method 8260C and 1,4-dioxane via Method 8270D SIM by Katahdin. All development and purge water was managed as investigation derived waste (IDW). Groundwater sample logs and data validation packages are included in Appendix A.

Monitoring wells RE129D1 and RE129D2 were sampled by Resolution Consultants on June 20, 2016. The cooler containing the 1,4-Dioxane samples was lost by the courier, thus these wells were resampled for 1,4-Dioxane on June 24, 2016. Analytical results and stabilized field parameters for these data are summarized in Table 3 and 4, respectively. Data validation is documented in

Appendix A. These monitoring wells will be included in quarterly sampling as part of the Navy's ongoing Environmental Restoration Program.

## 2.4 Decontamination and Investigation Derived Waste (IDW)

Resolution Consultants utilized dedicated and disposable sampling equipment when possible to avoid the potential for cross-contamination of samples. The sampling equipment included dedicated plastic scoops, disposable polyethylene tubing, disposable gloves, and laboratory supplied sample bottles. Hand held equipment and split spoons were decontaminated using Luminox and water wash, a potable water rinse, followed by a distilled water rinse. Water was collected in 5-gallon pails or 55-gallon drums. Non dedicated sampling equipment was decontaminated as outlined in the UFP SAP Addendum - *Groundwater Sampling Using Low Stress (Low Flow) Purging and Sampling Protocol* (Resolution Consultants, 2013b).

As part of the IDW management practices and in accordance with the SAP, the investigation waste (consisting of soil cuttings, drilling muds, IDW fluids, and personal protective equipment [PPE]) generated during the groundwater monitoring well installation and sampling was containerized and staged at NWIRP Bethpage.

IDW solids were containerized in roll offs. Representative samples from each roll off were submitted to Katahdin for analysis of:

- Target Compound List (TCL) VOCs
- TCL Semi-volatile Organic Compounds (SVOCs)
- Toxicity Characteristic Leaching Procedure (TCLP) Metals
- Polychlorinated Biphenyls (PCBs)
- Total petroleum hydrocarbons
- Corrosivity
- Ignitability
- Reactive Cyanide
- Reactive Sulfide
- Paint Filter

IDW fluid generated during well development and purging was containerized in frac tanks and stored at NWIRP Bethpage for characterization and ultimate disposal to the Publicly Owned

Treatment Works (POTW), in accordance with the facilities existing discharge permit. A representative water sample was collected from each frac tank and submitted to Katahdin for analysis of VOCs via Method SW 624, pH via Method SW 9040B, PCBs via Method 8082 and Total Metals via Method SW 846. All analytical criteria were met for disposal of water.

## 2.5 Surveying

A survey of the monitoring well locations was conducted at the end of fieldwork by C. T. Male, Inc., of Latham, NY, under the direct supervision of Resolution Consultants. The locations were tied into the existing base map developed for this investigation. The survey elevation is referenced to the North American Vertical Datum (NAVD) 1988 and has a vertical accuracy of 0.01 foot. Vertical control is based on observations of the Continuously Operating Reference (COR) Stations Queens and Central Islip. The horizontal location is referenced to the North American Datum (NAD) 1983 (2011) NY. Long Island Zone 3104 and has an accuracy of 0.1 foot. Local horizontal and vertical control is based on Global Positioning System (GPS) observations using the NYSNet Real Time Network.

A table of survey data (latitude/longitude, northing/easting, elevations of ground, rim and PVC) and a survey map is included in Appendix A.

### 3.0 REFERENCES

Geraghty and Miller, Inc., 1994. *Remedial Investigation Report, Grumman Aerospace Corporation, Bethpage, New York*. Revised September 1994.

Resolution Consultants, 2013a. *United Federal Programs Sampling and Analysis Plan, Site OU-2 Offsite Trichloroethene (TCE) Groundwater Plume Investigation, Bethpage, New York*. April 2013.

Resolution Consultants, 2013b. UFP SAP Addendum, *Groundwater Sampling Using Low Stress (Low Flow) Purging and Sampling Protocol*. November 2013.

Resolution Consultants, 2013c. UFP SAP Addendum, *Installation of Vertical Profile Borings and Monitoring Wells*. December 2013.

Resolution Consultants, 2016. *2015-2016 OU2 Groundwater Investigation VPB163, Bethpage, NY*. September 2016.

Smolensky, D., and Feldman, S., 1990. *Geohydrology of the Bethpage-Hicksville-Levittown Area, Long Island, New York, U.S.* Geological Survey Water-Resourced Investigations Report 88-4135, 25 pp.

## Tables

TABLE 1  
MONITORING WELL CONSTRUCTION SUMMARY  
2016 OU2 GROUNDWATER INVESTIGATION  
NWIRP BETHPAGE, NY

MONITORING WELL	WELL COMPLETION DATE	GROUND ELEVATION (MSL)	PVC ELEVATION (INNER CASING) (MSL)	WELL DEPTH (ft bgs)	CASING DEPTH (ft bgs)	SCREEN INTERVAL (ft bgs)	SUMP DEPTH INTERVAL (ft bgs)	BORING DEPTH (ft bgs)
RE129D1	4/8/2016	54.09	53.63	715	53	690 - 710	710 - 715	728
RE129D2	3/17/2016	53.96	53.52	830	53	805 - 825	825 - 830	843

MSL - mean sea level

ft bgs - feet below ground surface

TABLE 2  
MONITORING WELL DEVELOPMENT SUMMARY  
2016 OU2 GROUNDWATER INVESTIGATION  
NWIRP BETHPAGE, NY

MONITORING WELL	AIR DEVELOPMENT		PUMP DEVELOPMENT			APPROX. TOTAL DEVELOPMENT VOLUME (GAL)	FINAL TURBIDITY (NTUs)
	DATE	APPROX. VOLUME (GAL)	DATE	FINAL PUMP DEPTH (FT BGS)	APPROX. VOLUME (GAL)		
RE129D1	4/15/16, 4/19/16	5,500	4/21/16, 4/22/16	690-710	9,000	14,500	4.95
RE129D2	4/19/16, 4/20/16	7,000	4/25/2016	805 - 825	7,100	14,100	43.48

GAL - gallon

FT BGS - feet below ground surface

NTUs - Nephelometric Turbidity Units



TABLE 3. ANALYTICAL DATA SUMMARY  
2016 GROUNDWATER INVESTIGATION  
NWIRP BETHPAGE, NY

December 2016

Location	NYSDEC Groundwater Guidance or Standard Value (Note 1)	RE129D1	RE129D2
Sample Date		6/20/2016 (Note 2)	6/20/2016 (Note 2)
Sample ID		RE129D1-GW-062016	RE129D2-GW-062016
Sample type code		N	N
<b>VOC 8260C (ug/L)</b>			
1,1,1-TRICHLOROETHANE	5	<0.50 U	<0.50 U
1,1,2,2-TETRACHLOROETHANE	5	<0.50 U	<0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	<0.50 U	<0.50 U
1,1,2-TRICHLOROETHANE	1	<0.50 U	<0.50 U
1,1-DICHLOROETHANE	5	<0.50 U	<0.50 U
1,1-DICHLOROETHENE	5	<0.50 U	<0.50 U
1,2,4-TRICHLOROBENZENE	5	<0.50 U	<0.50 U
1,2-DIBROMO-3-CHLOROPROPANE	0.04	<b>&lt;0.75 U</b>	<b>&lt;0.75 U</b>
1,2-DIBROMOETHANE	NL	<0.50 U	<0.50 U
1,2-DICHLOROBENZENE	3	<0.50 U	<0.50 U
1,2-DICHLOROETHANE	5	<0.50 U	<0.50 U
1,2-DICHLOROETHENE, TOTAL	5	<1.0 U	<1.0 U
1,2-DICHLOROPROPANE	1	<0.50 U	<0.50 U
1,3-DICHLOROBENZENE	3	<0.50 U	<0.50 U
1,4-DICHLOROBENZENE	3	<0.50 UJ	<0.50 UJ
1,4-DIOXANE (Method 8270D_SIM)	NL	<0.17 U	<0.17 U
2-BUTANONE	50	<2.5 U	<2.5 U
2-HEXANONE	50	<2.5 U	<2.5 U
4-METHYL-2-PENTANONE	NL	<2.5 U	<2.5 U
ACETONE	50	<b>3.2 J</b>	<b>2.5 J</b>
BENZENE	1	<0.50 U	<0.50 U
BROMODICHLOROMETHANE	50	<0.50 U	<0.50 U
BROMOFORM	50	<0.50 U	<0.50 U
BROMOMETHANE	5	<1.0 UJ	<1.0 UJ
CARBON DISULFIDE	60	<0.50 UJ	<0.50 UJ
CARBON TETRACHLORIDE	5	<0.50 U	<0.50 U
CHLOROBENZENE	5	<0.50 U	<0.50 U
CHLOROETHANE	5	<1.0 U	<1.0 U
CHLOROFORM	7	<0.50 U	<0.50 U
CHLOROMETHANE	5	<1.0 U	<1.0 U
CIS-1,2-DICHLOROETHENE	5	<0.50 U	<0.50 U
CIS-1,3-DICHLOROPROPENE	0.4	<b>&lt;0.50 U</b>	<b>&lt;0.50 U</b>
CYCLOHEXANE	NL	<0.50 U	<0.50 U
DIBROMOCHLOROMETHANE	5	<0.50 U	<0.50 U
DICHLORODIFLUOROMETHANE	5	<1.0 U	<1.0 U
ETHYLBENZENE	5	<0.50 U	<0.50 U
ISOPROPYLBENZENE	5	<0.50 U	<0.50 U
M- AND P-XYLENE	NL	<1.0 U	<1.0 U
METHYL ACETATE	NL	<0.75 U	<0.75 U
METHYL CYCLOHEXANE	NL	<0.50 U	<0.50 U
METHYL TERT-BUTYL ETHER	10	<0.50 U	<0.50 U
METHYLENE CHLORIDE	5	<2.5 U	<2.5 U
O-XYLENE	NL	<0.50 U	<0.50 U
STYRENE	5	<0.50 U	<0.50 U
TETRACHLOROETHENE	5	<0.50 U	<0.50 U
TOLUENE	5	<0.50 U	<0.50 U
TRANS-1,2-DICHLOROETHENE	5	<0.50 U	<0.50 U
TRANS-1,3-DICHLOROPROPENE	0.4	<b>&lt;0.50 U</b>	<b>&lt;0.50 U</b>
TRICHLOROETHENE	5	<0.50 U	<0.50 U
TRICHLOROFUOROMETHANE	5	<1.0 U	<1.0 U
VINYL CHLORIDE	2	<1.0 U	<1.0 U
XYLENES, TOTAL	5	<1.5 U	<1.5 U

**Notes:**

**1** New York State Department of Environmental Conservation Division of Water Technical and Operation Guidance series  
(6 NYCRR 700-706, Part 703.5 summarized in TOGS 1.1.1)

Ambient water quality standards and groundwater effluent limitations, class GA; NL = Not Listed

**2** 1,4-Dioxane was resampled on 6/24/16 at RE123D1, RE123D2, RE123D3, RE129D1 and RE129D2 due to loss of cooler by courier.

**Bold** = Detected; ***Bold and Italics*** = Not detected exceeds NYS Groundwater Standards or guidance value

Yellow highlighted values exceed Groundwater Standards or guidance value

Sample type codes: N - normal environmental sample, FD - field duplicate

U = Nondetected result. The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte.

TABLE 4  
STABILIZED FIELD PARAMETERS  
2016 OU2 GROUNDWATER INVESTIGATION  
NWIRP BETHPAGE, NY

December 2016

Well	Date	Temperature (°C)	pH	Specific Conductance (µS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to water (ft bgs)	Flow rate (ml/min)
RE129D1	6/24/2016	17.64	5.04	0.030	0.72	95.3	6.06	26.34	650
RE129D2	6/24/2016	16.36	3.70	0.024	0.34	123.9	11.7	26.38	725

°C - degrees Celsius

µS/cm - Microsiemens per Centimeter

mg/L - milligrams per liter

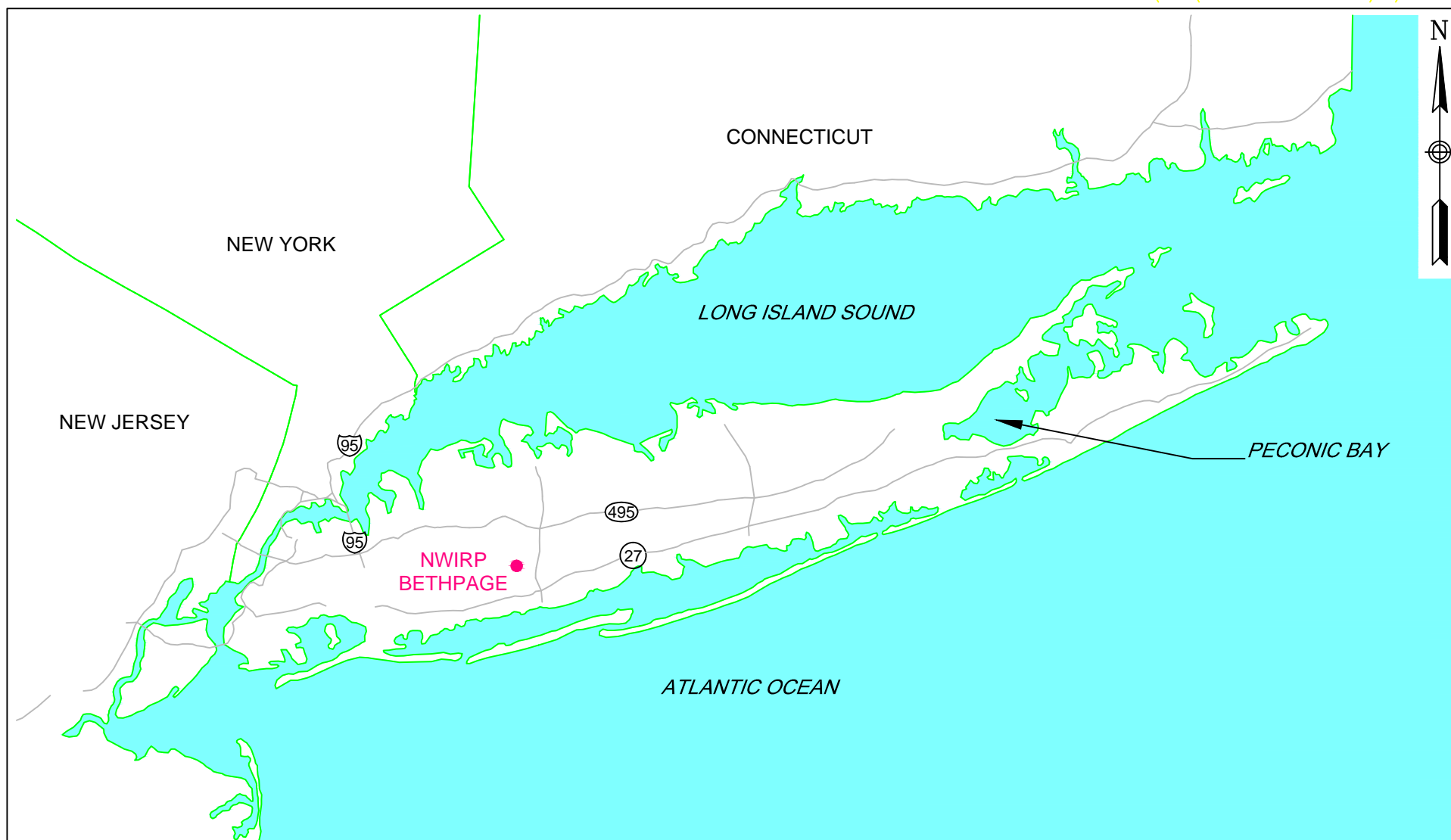
mV - Millivolts

NTU - Nephelometric Turbidity Unit

ft bgs - feet below ground surface

ml/min - milliliters per minute

## Figures



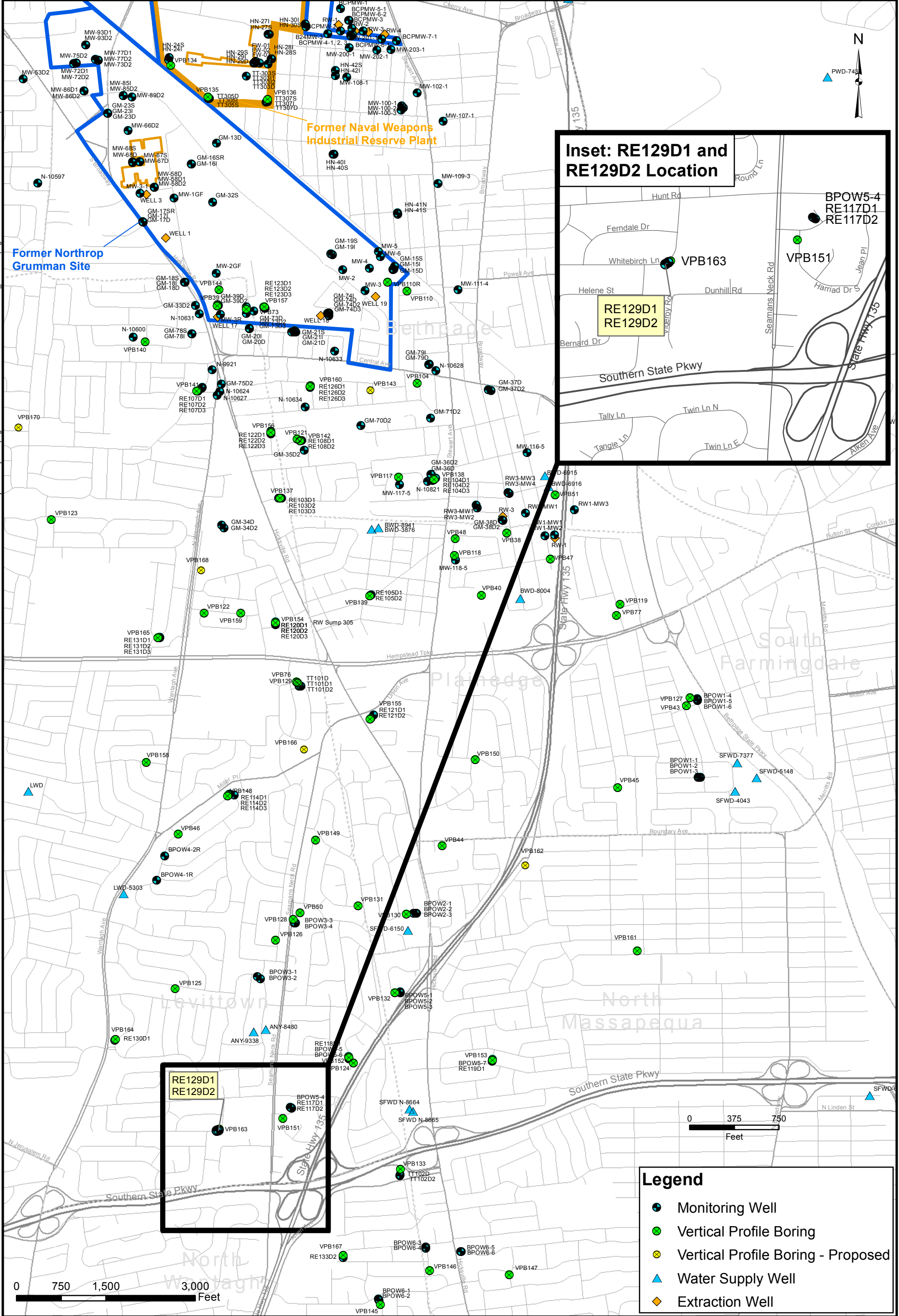
0 15 30  
SCALE IN MILES



GENERAL LOCATION MAP  
NWIRP BETHPAGE  
BETHPAGE, NEW YORK

CONTRACT NUMBER N62470-11-D-8013		CTO NUMBER WE15	
APPROVED BY --		DATE --	
APPROVED BY --		DATE --	
FIGURE NO. 1			REV 0

F:\Projects\Navy\Bethpage WXE087.0 Deliverables\7.2 CADD\GIS\_files\Bethpage\MAP DOCS\MXD\MISC\Location Maps\F2 RE129 2016 07 13 R1.mxd



RE129D1 AND RE129D2 LOCATION MAP  
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT  
BETHPAGE, NEW YORK

CONTRACT NUMBER N62470-11-D8013	CTO NUMBER WE 15
APPROVED BY PS	DATE 7/13/2016
APPROVED BY	DATE
FIGURE NO. 2	REV 0

## Appendices

## Appendix A

RE129D1, RE129D



## Section 1

### Boring Logs

<b>Client:</b> Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic			<b>Logged By:</b> G. Hicks		
<b>Location:</b> White Birch Ln & Sarah Dr, Town of Hempstead, NY			<b>Drilling Company:</b> Delta Well & Pump		
<b>Project #:</b> 60266526		<b>Ground Elevation (msl):</b> 54.09		<b>Well Screen Interval (ft):</b> 690-710	
<b>Start Date:</b> 3/28/2016		<b>Drilling Method:</b> Auger (0-50' bgs) Mud Rotary (>50' bgs)		<b>Water Level (ft):</b>	
<b>Finish Date:</b> 4/8/2016		<b>Northing:</b> 196086.63	<b>Easting:</b> 1124099.54	<b>Total Depth (ft):</b> 728.0	

DEPTH (ft)	PID (ppm)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION	Well Completion	Well Construction
0					0-693 ft bgs; See VPB163 for Descriptions		
50							10" Diameter Steel Casing
100							
150							
200							
250							Bentonite Grout
300							
350							
400							
450							
500							
550							4" Diameter Schedule 80 PVC Riser
600							

<b>Client:</b> Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic			<b>Logged By:</b> G. Hicks		
<b>Location:</b> White Birch Ln & Sarah Dr, Town of Hempstead, NY			<b>Drilling Company:</b> Delta Well & Pump		
<b>Project #:</b> 60266526		<b>Ground Elevation (msl):</b> 54.09		<b>Well Screen Interval (ft):</b> 690-710	
<b>Start Date:</b> 3/28/2016		<b>Drilling Method:</b> Auger (0-50' bgs) Mud Rotary (>50' bgs)		<b>Water Level (ft):</b>	
<b>Finish Date:</b> 4/8/2016		<b>Northing:</b> 196086.63 <b>Easting:</b> 1124099.54		<b>Total Depth (ft):</b> 728.0	

DEPTH (ft)	PID (ppm)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION	Well Completion	Well Construction
636					0-693 ft bgs; See VPB163 for Descriptions ( <i>continued</i> )		4" Diameter Schedule 80 PVC Riser ( <i>continued</i> )
638							
640							
642							
644							
646							
648							
650							
652							
654							
656							
658							
660							
662							
664							
666							
668							
670							
672							
674							
676							
678							
680							
682							
684							
686							
688							
690							
692							
694	0		SW		Pale yellow (5Y 7/3) well graded fine to coarse subangular SAND, trace fine subrounded gravel, trace muscovite		4" Diameter Schedule 80 PVC, 10 Slot Well Screen (690-710 ft bgs)
696							
698	0		SW		Light yellowish brown (10YR 6/4) well graded fine to coarse subrounded SAND, trace fine subrounded gravel, trace muscovite		
700							
702	0		SP		Pale yellow (5Y 7/3) poorly graded medium subrounded SAND, little coarse subrounded Sand, trace fine subrounded gravel		
704							
706	0		SC		Dark gray (5Y 4/1) firm Clayey fine SAND, trace lignite		
708							
710							
712							
714							
716							
718							
720							
722							
724							
726							
728					End of boring at 728.0 ft. bgs.		

# Resolution Consultants

## Boring Log

BORING #: RE129D2  
Sheet 1 of 2

<b>Client:</b> Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic			<b>Logged By:</b> G. Hicks		
<b>Location:</b> White Birch Ln & Sarah Dr, Town of Hempstead, NY			<b>Drilling Company:</b> Delta Well & Pump		
<b>Project #:</b> 60266526		<b>Ground Elevation (msl):</b> 53.96		<b>Well Screen Interval (ft):</b> 805-825	
<b>Start Date:</b> 2/25/2016		<b>Drilling Method:</b> Auger (0-50' bgs) Mud Rotary (>50' bgs)		<b>Water Level (ft):</b>	
<b>Finish Date:</b> 3/17/2016		<b>Northing:</b> 196073.15 <b>Easting:</b> 1124074.20		<b>Total Depth (ft):</b> 843.0	

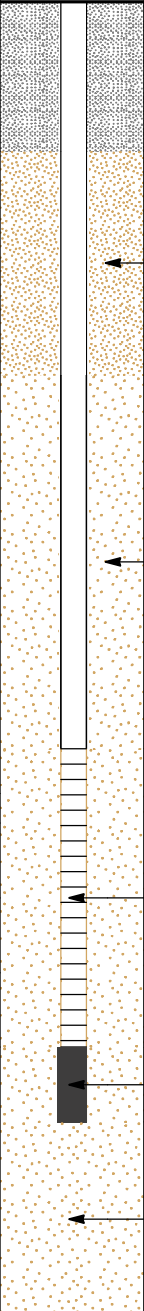


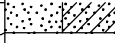

DEPTH (ft)	PID (ppm)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION	Well Completion	Well Construction
0					0-808 ft bgs; See VPB163 for Descriptions		
50							10" Diameter Steel Casing
100							
150							
200							
250							
300							
350							
400							Bentonite Grout
450							
500							
550							
600							
650							
700							
750							4" Diameter Schedule 80 PVC Riser

# Resolution Consultants

## Boring Log

BORING #: RE129D2  
Sheet 2 of 2

Client: Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic			Logged By: G. Hicks		
Location: White Birch Ln & Sarah Dr, Town of Hempstead, NY			Drilling Company: Delta Well & Pump		
Project #: 60266526		Ground Elevation (msl): 53.96		Well Screen Interval (ft): 805-825	
Start Date: 2/25/2016		Drilling Method: Auger (0-50' bgs) Mud Rotary (>50' bgs)		Water Level (ft):	
Finish Date: 3/17/2016		Northing: 196073.15 Easting: 1124074.20		Total Depth (ft): 843.0	

DEPTH (ft)	PID (ppm)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION	Well Completion	Well Construction
756					0-808 ft bgs; See VPB163 for Descriptions <i>(continued)</i>		4" Diameter Schedule 80 PVC Riser <i>(continued)</i>
758							
760							
762							
764							
766							
768							
770							
772							
774							
776							
778							
780							
782							
784							
786							
788							
790							
792							
794							
796							
798							
800							
802							
804							
806							
808	0		SP		Light grey (Gley 7/N) poorly graded medium subrounded SAND, trace Silt, trace muscovite		
810							
812	0		SP		Light grey (Gley 7/N) poorly graded medium subrounded SAND, trace soft fat Clay, trace silt		
814							
816	0		SP-SC		Dark grey (10YR 4/1) poorly graded medium subangular SAND with soft fat CLAY, trace muscovite		4" Diameter Schedule 80 PVC, 10 Slot Well Screen (805-825 ft bgs)
818							
820	0		SP		Light gray (10YR 7/1) poorly graded medium subrounded SAND		
822							
824							
826							Sump
828							
830							#1 Sand to Bottom
832							
834							
836							
838							
840							
842							
					End of boring at 843.0 ft. bgs.		

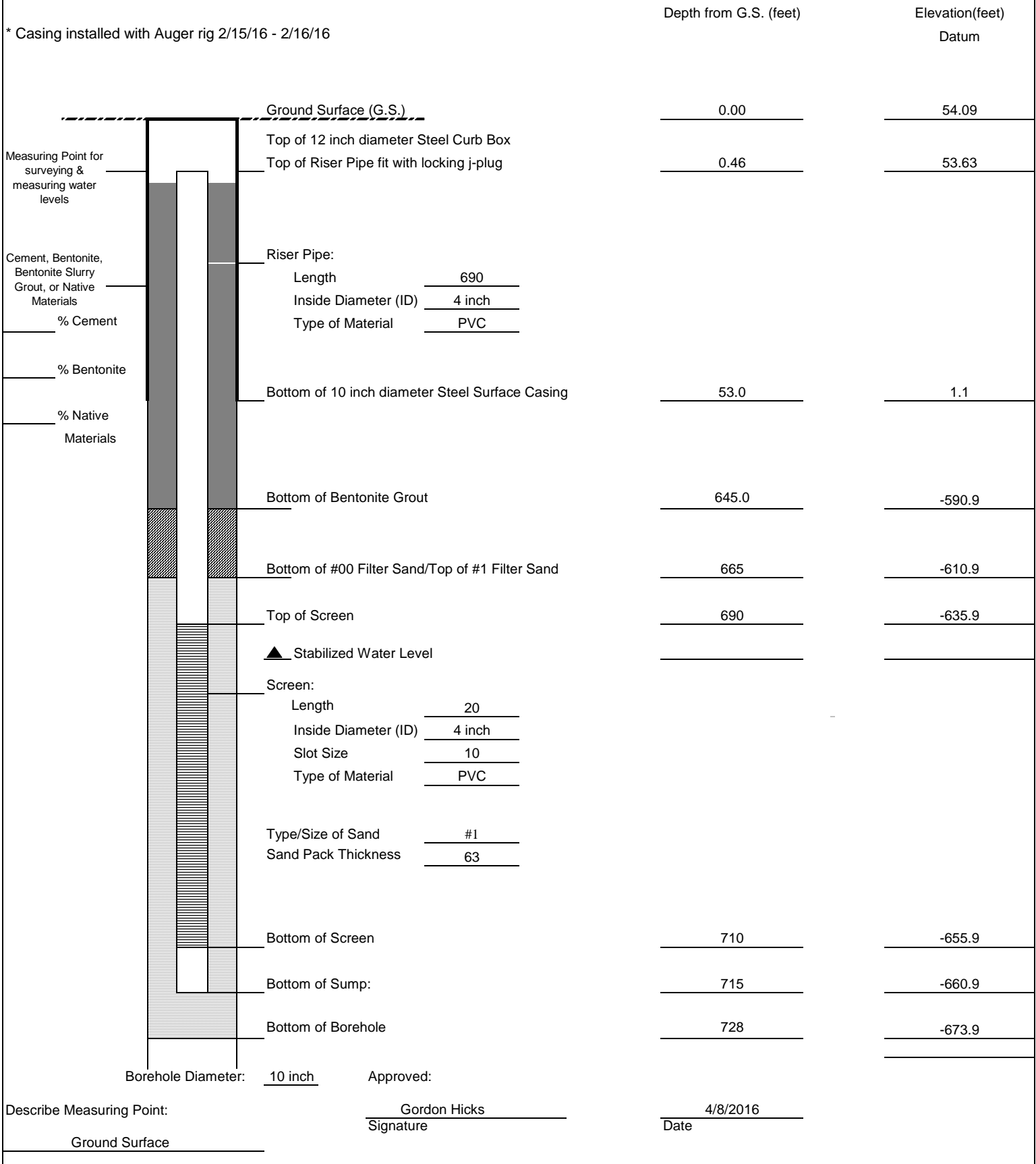
## Section 2

### Monitoring Well Construction Logs



Client: NAVFAC	Project Number: 60266526	<b>WELL ID: RE129D1</b>
Site Location: NWIRP BETHPAGE, NY		
Well Location: White Birch Ln & Sarah Dr, Town of Hempstead, NY		Date Installed: 3/28/2016 - 4/8/2016*
Method: MUD ROTARY		Inspector: G.Hicks
Coords: Northing: 196086.63 Easting: 1124099.54		Contractor: DELTA WELL & PUMP

### MONITORING WELL CONSTRUCTION DETAIL





Client: NAVFAC	Project Number: 60266526	<b>WELL ID: RE129D2</b>
Site Location: NWIRP BETHPAGE, NY		
Well Location: White Birch Ln & Sarah Dr, Town of Hempstead, NY		Date Installed: 2/25/16 - 3/17/2016*
Method: MUD ROTARY		Inspector: G.Hicks
Coords: Northing: 196073.15 Easting: 1124074.20		Contractor: DELTA WELL & PUMP

### MONITORING WELL CONSTRUCTION DETAIL

		Depth from G.S. (feet)	Elevation(feet) Datum
* Casing installed with Auger rig 2/17/16 - 2/18/16			
	Ground Surface (G.S.)	0.00	53.96
	Top of 12 inch diameter Steel Curb Box		
	Top of Riser Pipe fit with locking j-plug	0.44	53.52
	Riser Pipe:		
	Length	805	
	Inside Diameter (ID)	4 inch	
	Type of Material	PVC	
	Bottom of 10 inch diameter Steel Surface Casing	53.0	0.96
	Bottom of Bentonite Grout	765.0	-711.04
	Bottom of #00 Filter Sand/Top of #1 Filter Sand	780	-726.04
	Top of Screen	805	-751.04
	▲ Stabilized Water Level		
	Screen:		
	Length	20	
	Inside Diameter (ID)	4 inch	
	Slot Size	10	
	Type of Material	PVC	
	Type/Size of Sand	#1	
	Sand Pack Thickness	63	
	Bottom of Screen	825	-771.04
	Bottom of Sump:	830	-776.04
	Bottom of Borehole	843	-789.04
Borehole Diameter: 10 inch		Approved:	
Describe Measuring Point:		Gordon Hicks	3/15/2016
Ground Surface		Signature	Date



### Section 3

Hydropunch Data (278, 298, 318 ft bgs)

## Hydropunch Log

RE129D2 60266526 FI.WI3 stor: G. Hicks

NWI RP Bethpage

[illegible]

Location	NYSDEC Groundwater Guidance or Standard Value (Note 1)	RE129D2	RE129D2	RE129D2
Sample Date		2/26/2016	2/29/2016	2/29/2016
Sample ID		RE129D2-GW-278-280	RE129D2-GW-298-300	RE129D2-GW-318-320
Sample Interval (ft bgs)		278 - 280	298 - 300	318 - 320
Sample type code		N	N	N
<b>VOC 8260C (ug/L)</b>				
1,1,1-TRICHLOROETHANE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,1,2,2-TETRACHLOROETHANE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,1,2-TRICHLOROETHANE	1	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,1-DICHLOROETHANE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,1-DICHLOROETHENE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,2,4-TRICHLOROBENZENE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,2-DIBROMO-3-CHLOROPROPANE	0.04	< 0.75 UJ	< 0.75 UJ	< 0.75 UJ
1,2-DIBROMOETHANE	NL	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,2-DICHLOROBENZENE	3	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,2-DICHLOROETHANE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,2-DICHLOROETHENE, TOTAL	5	< 1 UJ	< 1 UJ	< 1 UJ
1,2-DICHLOROPROPANE	1	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,3-DICHLOROBENZENE	3	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
1,4-DICHLOROBENZENE	3	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
2-BUTANONE	50	< 2.5 UJ	< 2.5 UJ	< 2.5 UJ
2-HEXANONE	50	< 2.5 UJ	< 2.5 UJ	< 2.5 UJ
4-METHYL-2-PENTANONE	NL	< 2.5 UJ	< 2.5 UJ	< 2.5 UJ
ACETONE	50	12 J	28 J	4.4 J
BENZENE	1	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
BROMODICHLOROMETHANE	50	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
BROMOFORM	50	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
BROMOMETHANE	5	< 1 UJ	< 1 UJ	< 1 UJ
CARBON DISULFIDE	60	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
CARBON TETRACHLORIDE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
CHLOROBENZENE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
CHLOROETHANE	5	< 1 UJ	< 1 UJ	< 1 UJ
CHLOROFORM	7	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
CHLOROMETHANE	5	< 1 UJ	< 1 UJ	< 1 UJ
CIS-1,2-DICHLOROETHENE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
CIS-1,3-DICHLOROPROPENE	0.4	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
CYCLOHEXANE	NL	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
DIBROMOCHLOROMETHANE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
DICHLORODIFLUOROMETHANE	5	< 1 UJ	< 1 UJ	< 1 UJ
ETHYLBENZENE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
ISOPROPYLBENZENE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
M- AND P-XYLENE	NL	< 1 UJ	< 1 UJ	< 1 UJ
METHYL ACETATE	NL	< 0.75 UJ	< 0.75 UJ	< 0.75 UJ
METHYL CYCLOHEXANE	NL	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
METHYL TERT-BUTYL ETHER	10	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
METHYLENE CHLORIDE	5	< 2.5 UJ	< 2.5 UJ	< 2.5 UJ
O-XYLENE	NL	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
STYRENE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
TETRACHLOROETHENE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
TOLUENE	5	0.86 J	< 0.5 UJ	< 0.5 UJ
TRANS-1,2-DICHLOROETHENE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
TRANS-1,3-DICHLOROPROPENE	0.4	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
TRICHLOROETHENE	5	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ
TRICHLOROFLUOROMETHANE	5	< 1 UJ	< 1 UJ	< 1 UJ
VINYL CHLORIDE	2	< 1 UJ	< 1 UJ	< 1 UJ
XYLENES, TOTAL	5	< 1.5 UJ	< 1.5 UJ	< 1.5 UJ

**Notes:**

1 New York State Department of Environmental Conservation Division of Water Technical and Operation Guidance series  
(6 NYCRR 700-706, Part 703.5 summarized in TOGS 1.1.1)

Ambient water quality standards and groundwater effluent limitations, class GA; NL = Not Listed

**Bold** = Detected; **Bold and Italics** = Not detected exceeds NYS Groundwater Standards or guidance value

Yellow highlighted values exceed Groundwater Standards or guidance value

Sample type codes: N - normal environmental sample, FD - field duplicate

U = Nondetected result. The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

M = the matrix spike or matrix spike duplicate did not meet recovery or precision requirements.

## DATA VALIDATION REPORT

Project:	Regional Groundwater Investigation — NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Sample Delivery Group:	SJ1374	
Analyses/Method:	Volatile Organic Compounds by U.S. EPA SW-846 Method 8260C	
Validation Level:	3	
Project Number:	0888812477.SA.DV	
Prepared by:	Dana Miller/Resolution Consultants	Completed on: 03/15/2016
Reviewed by:	Tina Cantwell/Resolution Consultants	File Name: SJ1374_8260C

## SUMMARY

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage Site on 26 and 29 February 2016 in accordance with the following Sampling and Analysis Plans:

- *Sampling and Analysis Plan, Bethpage, New York.* (Resolution Consultants, April 2013).
- *UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York.* (Resolution Consultants, November 2013).
- *UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York.* (Resolution Consultants, August 2014).

Sample ID	Matrix/Sample Type	Analysis
RE129D2-TB-022616	Trip Blank	8260C
RE129D2-GW-022616-278-280	Groundwater	8260C
RE129D2-GW-022916-298-300	Groundwater	8260C
RE129D2-GW-022916-318-320	Groundwater	8260C

Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 8260C, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (United States Environmental Protection Agency [U.S. EPA] 2006), *U.S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (U.S. EPA, June 2008), and *Department of Defense Quality Systems Manual for Environmental Laboratories*, Version 4.2

(October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements, and/or professional judgment were used as appropriate.

## REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- X Data completeness (chain-of-custody) / sample integrity
- ✓ Holding times and sample preservation
- ✓ Gas chromatography/Mass spectrometer performance checks
- X Initial calibration (ICAL) / initial calibration verification (ICV) / continuing calibration verification (CCV)
- ✓ Laboratory blanks / trip blanks / field blanks
- ✓ Surrogate spike recoveries
- NA Matrix spike and/or matrix spike duplicate results
- ✓ Laboratory control sample / laboratory control sample duplicate results
- NA Field duplicates
- ✓ Internal standards
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Acceptable data parameters for which all criteria were met and no qualification was performed, and non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further. The symbol (X) indicates that a QC non-conformance resulted in the qualification of data. Any QC non-conformance that resulted in the qualification of data is discussed below.

## RESULTS

### Data Completeness/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- the COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody;

- the laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory;
- completeness of analyses was verified by comparing the reported results to the COC request.

Below shows a list of samples that were mostly comprised of soil in all vials and not very much liquid:

- Samples RE129D2-GW-022616-278-280 (SJ1374-2), RE129D2-GW-022916-298-300 (SJ1374-3) and RE129D2-GW-022916-318-320 (SJ1374-4) contained mostly soil in all three vials. One vial from sample SJ1374-2 was decanted and analyzed. Three vials from sample SJ1374-3 and two vials from sample SJ1374-4 were decanted and compounded into one vial for each sample and analyzed.

Positive and non-detected results for all decanted samples were qualified as estimated (J and UJ) respectively due to possible loss of sample integrity during the decanting process.

Sample integrity non-conformances are summarized in Attachment A in Table A-1.

Initial Calibration/ Initial Calibration Verification / Continuing Calibration Verification  
Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- The ICAL percent relative standard deviation, correlation coefficient/coefficient of determination, and/or response factor method acceptance criteria were met
- The ICV standard percent recovery acceptance criteria were met
- The CCV method percent difference or percent drift and response factor acceptance criteria were met
- The retention time method acceptance criteria were met

Data qualification to the analytes associated with the specific ICAL was as follows:

ICAL Linearity Non-conformance:

Criteria	Actions	
	Detected Results	Non-detected Results
%RSD >15% and quantitation based on mean response factor	J	UJ

*Notes:*

%RSD = Relative standard deviation  
J = Estimated  
UJ = Undetected and estimated

Data qualification to the analytes associated with the specific ICV was as follows:

ICV Recovery Non-conformance:

Criteria	Actions	
	Detected Results	Non-detected Results
Recovery > 120%	J	UJ
Recovery < 80%	J	UJ

*Notes:*

J = Estimated  
UJ = Undetected and estimated

Data qualification to the analytes associated with the specific CCV was as follows:

CCV Linearity Non-conformance:

Criteria	Actions	
	Detected Results	Non-detected Results
%Difference or %Drift > 20%	J	UJ

*Notes:*

J = Estimated  
UJ = Undetected and estimated

ICV and CCV non-conformances are summarized in Attachment A in Tables A-2 and A-3.

### Qualifications Actions

The data were reviewed independently from the laboratory to assess data quality. All compounds detected at concentrations less than the limit of quantitation but greater than the method detection limit were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation. Data not qualified during data review are considered usable by the project. The remaining results qualified as estimated may be high or low, but the data are usable for their intended purpose, according to U.S. EPA and Department of Defense guidelines. Final data review qualifiers used to describe results and how they should be interpreted by the end data user are provided in Attachment B and Attachment C. Attachment D provides final results after data review.



## ATTACHMENTS

Attachment A: Non-Conformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Attachment D: Final Results after Data Review

Attachment A  
Non-Conformance Summary Table

Table A-1  
Sample Integrity Non-Conformance

Method	Sample ID	Analyte	Units	Result	Qualifier
8260C	RE129D2-GW-022616-278-280	1,1,1-TRICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,1,2,2-TETRACHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	FREON 113	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,1,2-TRICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,1-DICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,1-DICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,2,4-TRICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,2-DIBROMO-3-CHLOROPROPANE	UG_L	0.75	UJ
8260C	RE129D2-GW-022616-278-280	1,2-DIBROMOETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,2-DICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,2-DICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,2-DICHLOROETHENE, TOTAL	UG_L	1	UJ
8260C	RE129D2-GW-022616-278-280	1,2-DICHLOROPROPANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,3-DICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	1,4-DICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	2-BUTANONE	UG_L	2.5	UJ
8260C	RE129D2-GW-022616-278-280	2-HEXANONE	UG_L	2.5	UJ
8260C	RE129D2-GW-022616-278-280	4-METHYL-2-PENTANONE	UG_L	2.5	UJ
8260C	RE129D2-GW-022616-278-280	ACETONE	UG_L	12	J
8260C	RE129D2-GW-022616-278-280	BENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	BROMODICHLOROMETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	BROMOFORM	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	BROMOMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022616-278-280	CARBON DISULFIDE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	CARBON TETRACHLORIDE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	CHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	CHLOROETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022616-278-280	CHLOROFORM	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	CHLOROMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022616-278-280	CIS-1,2-DICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	CIS-1,3-DICHLOROPROPENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	CYCLOHEXANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	DIBROMOCHLOROMETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	DICHLORODIFLUOROMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022616-278-280	ETHYLBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	ISOPROPYLBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	M- AND P-XYLENE	UG_L	1	UJ
8260C	RE129D2-GW-022616-278-280	METHYL ACETATE	UG_L	0.75	UJ
8260C	RE129D2-GW-022616-278-280	METHYL CYCLOHEXANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	METHYL TERT-BUTYL ETHER	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	METHYLENE CHLORIDE	UG_L	2.5	UJ
8260C	RE129D2-GW-022616-278-280	O-XYLENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	STYRENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	TETRACHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	TOLUENE	UG_L	0.86	J
8260C	RE129D2-GW-022616-278-280	TRANS-1,2-DICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	TRANS-1,3-DICHLOROPROPENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	TRICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-278-280	TRICHLOROFLUOROMETHANE	UG_L	1	UJ

Table A-1  
Sample Integrity Non-Conformance

Method	Sample ID	Analyte	Units	Result	Qualifier
8260C	RE129D2-GW-022616-278-280	VINYL CHLORIDE	UG_L	1	UJ
8260C	RE129D2-GW-022616-278-280	XYLENES, TOTAL	UG_L	1.5	UJ
8260C	RE129D2-GW-022616-298-300	1,1,1-TRICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,1,2,2-TETRACHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	FREON 113	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,1,2-TRICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,1-DICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,1-DICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,2,4-TRICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,2-DIBROMO-3-CHLOROPROPANE	UG_L	0.75	UJ
8260C	RE129D2-GW-022616-298-300	1,2-DIBROMOETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,2-DICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,2-DICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,2-DICHLOROETHENE, TOTAL	UG_L	1	UJ
8260C	RE129D2-GW-022616-298-300	1,2-DICHLOROPROPANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,3-DICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	1,4-DICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	2-BUTANONE	UG_L	2.5	UJ
8260C	RE129D2-GW-022616-298-300	2-HEXANONE	UG_L	2.5	UJ
8260C	RE129D2-GW-022616-298-300	4-METHYL-2-PENTANONE	UG_L	2.5	UJ
8260C	RE129D2-GW-022616-298-300	ACETONE	UG_L	28	J
8260C	RE129D2-GW-022616-298-300	BENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	BROMODICHLOROMETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	BROMOFORM	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	BROMOMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022616-298-300	CARBON DISULFIDE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	CARBON TETRACHLORIDE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	CHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	CHLOROETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022616-298-300	CHLOROFORM	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	CHLOROMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022616-298-300	CIS-1,2-DICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	CIS-1,3-DICHLOROPROPENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	CYCLOHEXANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	DIBROMOCHLOROMETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	DICHLORODIFLUOROMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022616-298-300	ETHYLBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	ISOPROPYLBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	M- AND P-XYLENE	UG_L	1	UJ
8260C	RE129D2-GW-022616-298-300	METHYL ACETATE	UG_L	0.75	UJ
8260C	RE129D2-GW-022616-298-300	METHYL CYCLOHEXANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	METHYL TERT-BUTYL ETHER	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	METHYLENE CHLORIDE	UG_L	2.5	UJ
8260C	RE129D2-GW-022616-298-300	O-XYLENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	STYRENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	TETRACHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	TOLUENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	TRANS-1,2-DICHLOROETHENE	UG_L	0.5	UJ

Table A-1 Sample Integrity Non-Conformance					
Method	Sample ID	Analyte	Units	Result	Qualifier
8260C	RE129D2-GW-022616-298-300	TRANS-1,3-DICHLOROPROPENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	TRICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022616-298-300	TRICHLOROFLUOROMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022616-298-300	VINYL CHLORIDE	UG_L	1	UJ
8260C	RE129D2-GW-022616-298-300	XYLENES, TOTAL	UG_L	1.5	UJ
8260C	RE129D2-GW-022916-318-320	1,1,1-TRICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,1,2,2-TETRACHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	FREON 113	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,1,2-TRICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,1-DICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,1-DICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,2,4-TRICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,2-DIBROMO-3-CHLOROPROPANE	UG_L	0.75	UJ
8260C	RE129D2-GW-022916-318-320	1,2-DIBROMOETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,2-DICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,2-DICHLOROETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,2-DICHLOROETHENE, TOTAL	UG_L	1	UJ
8260C	RE129D2-GW-022916-318-320	1,2-DICHLOROPROPANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,3-DICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	1,4-DICHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	2-BUTANONE	UG_L	2.5	UJ
8260C	RE129D2-GW-022916-318-320	2-HEXANONE	UG_L	2.5	UJ
8260C	RE129D2-GW-022916-318-320	4-METHYL-2-PENTANONE	UG_L	2.5	UJ
8260C	RE129D2-GW-022916-318-320	ACETONE	UG_L	4.4	J
8260C	RE129D2-GW-022916-318-320	BENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	BROMODICHLOROMETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	BROMOFORM	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	BROMOMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022916-318-320	CARBON DISULFIDE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	CARBON TETRACHLORIDE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	CHLOROBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	CHLOROETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022916-318-320	CHLOROFORM	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	CHLOROMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022916-318-320	CIS-1,2-DICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	CIS-1,3-DICHLOROPROPENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	CYCLOHEXANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	DIBROMOCHLOROMETHANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	DICHLORODIFLUOROMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022916-318-320	ETHYLBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	ISOPROPYLBENZENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	M- AND P-XYLENE	UG_L	1	UJ
8260C	RE129D2-GW-022916-318-320	METHYL ACETATE	UG_L	0.75	UJ
8260C	RE129D2-GW-022916-318-320	METHYL CYCLOHEXANE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	METHYL TERT-BUTYL ETHER	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	METHYLENE CHLORIDE	UG_L	2.5	UJ
8260C	RE129D2-GW-022916-318-320	O-XYLENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	STYRENE	UG_L	0.5	UJ

Table A-1 Sample Integrity Non-Conformance					
Method	Sample ID	Analyte	Units	Result	Qualifier
8260C	RE129D2-GW-022916-318-320	TETRACHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	TOLUENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	TRANS-1,2-DICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	TRANS-1,3-DICHLOROPROPENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	TRICHLOROETHENE	UG_L	0.5	UJ
8260C	RE129D2-GW-022916-318-320	TRICHLOROFLUOROMETHANE	UG_L	1	UJ
8260C	RE129D2-GW-022916-318-320	VINYL CHLORIDE	UG_L	1	UJ
8260C	RE129D2-GW-022916-318-320	XYLENES, TOTAL	UG_L	1.5	UJ

*Notes:*

UG\_L = Micrograms per liter  
 UJ = Non-detect estimated value  
 J = Estimated value

Table A-2 Initial Calibration Verification Non-Conformance						
Method	Analyte	ICV ID	%R	Limit	Associated Samples	Qualifier
8260C	ACETONE	WG179310-7	177.03	80-120	All samples in SDG	Detects: J Non-detects: UJ
8260C	2-BUTANONE	WG179310-7	139.13	80-120	All samples in SDG	Detects: J Non-detects: UJ
8260C	2-HEXANONE	WG179310-7	128.32	80-120	All samples in SDG	Detects: J Non-detects: UJ
8260C	CARBON DISULFIDE	WG179310-7	130.88	80-120	All samples in SDG	Detects: J Non-detects: UJ
8260C	DICHLORODIFLUOROMETHANE	WG179310-7	128.55	80-120	All samples in SDG	Detects: J Non-detects: UJ

*Notes:*

ICV ID = Initial calibration verification identification  
 %R = Percent recovery  
 SDG = Sample delivery group  
 UJ = Non-detect estimated value  
 J = Estimated value

Table A-3 Continuing Calibration Verification Non-Conformance					
Lab ID/ Instrument ID	Analyte	%D	%D Limit	Associated Samples	Qualifier
WG179677-4/GCMW-T	FREON 113	29.77948	+/- 20	All samples in SDG	Detects: J Non-detects: UJ
WG179677-4/GCMW-T	2-BUTANONE	24.9588	+/- 20	All samples in SDG	Detects: J Non-detects: UJ

*Notes:*

ID = Identification  
 %D = Percent difference  
 SDG = Sample delivery group  
 UJ = Non-detect estimated value  
 J = Detected estimated value



Attachment B  
Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual quantitation limit necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

Attachment C  
Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
bm	Missing blank information
bt	Trip blank contamination
c	Calibration issue
cr	Chromatographic resolution
d	Reporting limit raised due to chromatographic interference
dt	Dissolved result > total over limit
e	Ether interference
ej	Above calibration range; result estimated.
f	Presumed contamination from FB or ER.
fd	Field duplicate RPDs
h	Holding times
hs	Headspace greater than 6mm in all sample vials
i	Internal standard areas
ii	Injection internal standard area or retention time exceedance
it	Instrument tune
k	Estimated maximum possible concentrations (EMPC)
l	LCS recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
mc	Deviation from the method
md	MS/MSD RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
p-h	Uncertainty near detection limit (< Reporting Limit), historical reason code applied.
pe	Post Extraction Spike
q	Quantitation issue
r	Dual column RPD
rt	SIM ions not within + 2 seconds
s	Surrogate recovery
sp	Sample preparation issue
su	Evidence of ion suppression
t	Temperature Preservation Issue
x	Low % solids
y	Serial dilution results
z	ICS results

Attachment D  
Final Results after Data Review

Sample Delivery Group				SJ1374		
Lab ID				SJ1374-1		
Sample ID				RE129D2-TB-022616		
Sample Date				2/26/2016		
Sample Type				Trip Blank		
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	FREON 113	76-13-1	UG_L	0.5	UJ	c
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	U	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	UJ	c
8260C	2-HEXANONE	591-78-6	UG_L	2.5	UJ	c
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	2.5	UJ	c
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	UJ	c
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	U	
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U	
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	U	
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	

Sample Delivery Group Lab ID Sample ID Sample Date Sample Type				SJ1374 SJ1374-2 RE129D2-GW-022616-278-280 2/26/2016 Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	UJ	mc
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	UJ	mc
8260C	FREON 113	76-13-1	UG_L	0.5	UJ	c,mc
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	UJ	mc
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	UJ	mc
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	UJ	mc
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	UJ	mc
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	UJ	mc
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	UJ	mc
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	UJ	mc
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	UJ	mc
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	UJ	mc
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	UJ	mc
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	UJ	mc
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	UJ	mc
8260C	2-BUTANONE	78-93-3	UG_L	2.5	UJ	c,mc
8260C	2-HEXANONE	591-78-6	UG_L	2.5	UJ	c,mc
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	UJ	mc
8260C	ACETONE	67-64-1	UG_L	12	J	c,mc
8260C	BENZENE	71-43-2	UG_L	0.5	UJ	mc
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	UJ	mc
8260C	BROMOFORM	75-25-2	UG_L	0.5	UJ	mc
8260C	BROMOMETHANE	74-83-9	UG_L	1	UJ	mc
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	UJ	c,mc
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	UJ	mc
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	UJ	mc
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	mc
8260C	CHLOROFORM	67-66-3	UG_L	0.5	UJ	mc
8260C	CHLOROMETHANE	74-87-3	UG_L	1	UJ	mc
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	UJ	mc
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	UJ	mc
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	UJ	mc
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	UJ	mc
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c,mc
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	UJ	mc
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	UJ	mc
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	UJ	mc
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	UJ	mc
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	UJ	mc
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	UJ	mc
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	UJ	mc
8260C	O-XYLENE	95-47-6	UG_L	0.5	UJ	mc
8260C	STYRENE	100-42-5	UG_L	0.5	UJ	mc
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	UJ	mc
8260C	TOLUENE	108-88-3	UG_L	0.86	J	mc
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	UJ	mc
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	UJ	mc
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	UJ	mc
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	UJ	mc
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	UJ	mc
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	UJ	mc

Sample Delivery Group Lab ID Sample ID Sample Date Sample Type				SJ1374 SJ1374-3 RE129D2-GW-022616-298-300 2/29/2016 Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	UJ	mc
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	UJ	mc
8260C	FREON 113	76-13-1	UG_L	0.5	UJ	c,mc
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	UJ	mc
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	UJ	mc
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	UJ	mc
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	UJ	mc
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	UJ	mc
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	UJ	mc
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	UJ	mc
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	UJ	mc
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	UJ	mc
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	UJ	mc
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	UJ	mc
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	UJ	mc
8260C	2-BUTANONE	78-93-3	UG_L	2.5	UJ	c,mc
8260C	2-HEXANONE	591-78-6	UG_L	2.5	UJ	c,mc
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	UJ	mc
8260C	ACETONE	67-64-1	UG_L	28	J	c,mc
8260C	BENZENE	71-43-2	UG_L	0.5	UJ	mc
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	UJ	mc
8260C	BROMOFORM	75-25-2	UG_L	0.5	UJ	mc
8260C	BROMOMETHANE	74-83-9	UG_L	1	UJ	mc
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	UJ	c,mc
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	UJ	mc
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	UJ	mc
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	mc
8260C	CHLOROFORM	67-66-3	UG_L	0.5	UJ	mc
8260C	CHLOROMETHANE	74-87-3	UG_L	1	UJ	mc
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	UJ	mc
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	UJ	mc
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	UJ	mc
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	UJ	mc
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c,mc
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	UJ	mc
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	UJ	mc
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	UJ	mc
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	UJ	mc
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	UJ	mc
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	UJ	mc
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	UJ	mc
8260C	O-XYLENE	95-47-6	UG_L	0.5	UJ	mc
8260C	STYRENE	100-42-5	UG_L	0.5	UJ	mc
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	UJ	mc
8260C	TOLUENE	108-88-3	UG_L	0.5	UJ	mc
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	UJ	mc
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	UJ	mc
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	UJ	mc
8260C	TRICHLOROFUOROMETHANE	75-69-4	UG_L	1	UJ	mc
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	UJ	mc
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	UJ	mc



Sample Delivery Group Lab ID Sample ID Sample Date Sample Type				SJ1374 SJ1374-4 RE129D2-GW-022916-318-320 2/29/2016 Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	UJ	mc
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	UJ	mc
8260C	FREON 113	76-13-1	UG_L	0.5	UJ	c,mc
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	UJ	mc
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	UJ	mc
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	UJ	mc
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	UJ	mc
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	UJ	mc
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	UJ	mc
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	UJ	mc
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	UJ	mc
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	UJ	mc
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	UJ	mc
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	UJ	mc
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	UJ	mc
8260C	2-BUTANONE	78-93-3	UG_L	2.5	UJ	c,mc
8260C	2-HEXANONE	591-78-6	UG_L	2.5	UJ	c,mc
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	UJ	mc
8260C	ACETONE	67-64-1	UG_L	4.4	J	c,mc
8260C	BENZENE	71-43-2	UG_L	0.5	UJ	mc
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	UJ	mc
8260C	BROMOFORM	75-25-2	UG_L	0.5	UJ	mc
8260C	BROMOMETHANE	74-83-9	UG_L	1	UJ	mc
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	UJ	c,mc
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	UJ	mc
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	UJ	mc
8260C	CHLOROETHANE	75-00-3	UG_L	1	UJ	mc
8260C	CHLOROFORM	67-66-3	UG_L	0.5	UJ	mc
8260C	CHLOROMETHANE	74-87-3	UG_L	1	UJ	mc
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	UJ	mc
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	UJ	mc
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	UJ	mc
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	UJ	mc
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c,mc
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	UJ	mc
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	UJ	mc
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	UJ	mc
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	UJ	mc
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	UJ	mc
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	UJ	mc
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	UJ	mc
8260C	O-XYLENE	95-47-6	UG_L	0.5	UJ	mc
8260C	STYRENE	100-42-5	UG_L	0.5	UJ	mc
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	UJ	mc
8260C	TOLUENE	108-88-3	UG_L	0.5	UJ	mc
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	UJ	mc
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	UJ	mc
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	UJ	mc
8260C	TRICHLOROFUOROMETHANE	75-69-4	UG_L	1	UJ	mc
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	UJ	mc
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	UJ	mc

*Notes:*

UG\_L = Micrograms per liter  
Qual = Final interpreted qualifiers (See Attachment B)  
RC = Reason codes (See Attachment C)

## Section 4

### Groundwater Sample Log Sheets



**RESOLUTION  
CONSULTANTS**

1,4-Dioxane samples associated with this sample collection record (6/20/16) were lost by the courier. The well was resampled for 1,4-Dioxane on 6/24/16.

Well ID: RE129D1

## Low Flow Ground Water Sample Collection Record

Client: Navy NWIRP Bethpage Date: 6/20/16 Time: Start 1230 am/pm  
Project No: 60266526 Finish 1430 am/pm  
Site Location: White Birch  
Weather Conds: Sunny 85° Collector(s): \_\_\_\_\_

### 1. WATER LEVEL DATA: (measured from Top of Casing)

a. Total Well Length 715 c. Length of Water Column \_\_\_\_\_ (a-b) Casing Diameter/Material  
b. Water Table Depth 25.81 d. Calculated System Volume (see back) 13.1 gal - 26 ft screen  
4-inch PVC

### 2. WELL PURGE DATA

a. Purge Method: Geotech bladder pump with drop tube assembly  
b. Acceptance Criteria defined (see workplan)  
- Temperature  $\pm 3\%$  - Turbidity  $\pm 10\%$  - D.O.  $\pm 10\%$  (values  $>0.5$  mg/L)  
- pH  $\pm 0.1$  unit - ORP  $\pm 10$  mV  
- Sp. Cond.  $\pm 3\%$  - Drawdown  $< 0.3'$  Remove a minimum 1 screen volume

c. Field Testing Equipment used:

Make	Model	Serial Number
YSI	556	87546
<del>La Motte</del> Hanna	2020 WE	63616

Time (24hr)	Volume Removed (Liters)	Temp. (°C)	pH	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1245	0.1							800		
1310	-	17.37	4.81	0.032	1.04	239.1	18.1	700	26.14	Cloudy
1315	5 Gal	17.53	4.73	0.031	0.96	246.1	39.6	700	26.15	
1320		17.52	4.69	0.031	0.80	251.0			26.12	
1325		17.50	4.68	0.031	0.78	254.6	29.8	700	26.12	
1330		17.53	4.70	0.030	0.68	251.2				

d. Acceptance criteria pass/fail

Has required volume been removed

Yes No N/A

Has required turbidity been reached

☒ ☐ ☐

Have parameters stabilized

☒ ☐ ☐

If no or N/A - Explain below.

(continued on back)

### 3. SAMPLE COLLECTION:

Method: Geotech bladder pump with drop tube assembly

Sample ID	Container Type	No. of Containers	Preservation	Analysis Req.	Time
<u>RE129D1GW-062016</u>	40-mL vials	3	HCl	VOCs	1400
	1-L amber	2	none	1,4-Dioxane	

Comments

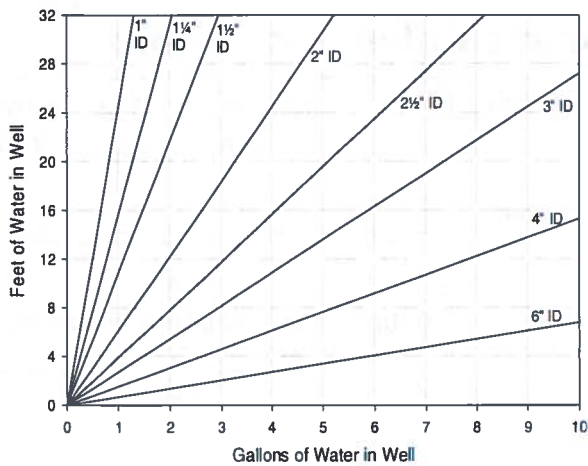
hit bottom, 25 ft too long

Signature

Paul Knecht

Date

6/20/16



Volume / Linear Ft. of Pipe		
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

One screen volume  
(4-inch well)

15 ft =	37.1 L / 9.8 G
20 ft =	49.4 L / 13.1 G
25 ft =	61.8 L / 16.3 G
30 ft =	74.3 L / 19.6 G
40 ft =	99.2 L / 26.1 G
50 ft =	123.6 L / 32.6 G

Well ID: RE12901

(continued from front)

[illegible]



**RESOLUTION  
CONSULTANTS**

1,4-Dioxane samples associated with this sample collection record (6/20/16) were lost by the courier. The well was resampled for 1,4-Dioxane on 6/24/16.

Well ID: RE12902

## Low Flow Groundwater Sample Collection Record

Client: Navy NWIRP Bethpage Date: 6/20/16 Time: Start 1305 am/pm  
Project No: 60266526 Finish 1300 am/pm  
Site Location: Whitehatch  
Weather Conds: Sunny 85° Collector(s): \_\_\_\_\_

### 1. WATER LEVEL DATA: (measured from Top of Casing)

a. Total Well Length 830 c. Length of Water Column \_\_\_\_\_ (a-b) Casing Diameter/Material  
b. Water Table Depth 25.41 d. Calculated System Volume (see back) 13.1 gal 20 screens  
4-inch PVC

### 2. WELL PURGE DATA

a. Purge Method: Geotech bladder pump with drop tube assembly  
b. Acceptance Criteria defined (see workplan)  
- Temperature  $\pm 3\%$  - Turbidity  $\pm 10\%$  - D.O.  $\pm 10\%$  (values  $>0.5$  mg/L)  
- pH  $\pm 0.1$  unit - ORP  $\pm 10$  mV  
- Sp. Cond.  $\pm 3\%$  - Drawdown  $< 0.3'$  Remove a minimum 1 screen volume

c. Field Testing Equipment used:

Make	Model	Serial Number
YSI	556	
Hanna		

Time (24hr)	Volume Removed (Liters)	Temp. (°C)	pH	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1310		17.98	3.89	0.029	3.35	177.5	-	650	26.75	Foggy / none
1315		17.79	3.76	0.029	2.96	182.1	27.5	650	25.95	"
1320		17.50	4.06	0.028	2.02	171.3	-	650	25.96	"
1325		17.31	4.23	0.028	1.66	164.3	27.7	650	25.96	"
1330		17.19	4.37	0.027	1.52	163.4	-	650	25.96	"
1335	5.91	17.13	4.56	0.027	1.39	158.9	40.9	625	25.96	"

d. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If no or N/A - Explain below.

(continued on back)

### 3. SAMPLE COLLECTION:

Method: Geotech bladder pump with drop tube assembly

Sample ID	Container Type	No. of Containers	Preservation	Analysis Req.	Time
<u>RE12902-GW-062016</u>	40-mL vials	3	HCl	VOCs	<u>1420</u>
	1-L amber	2	none	1,4-Dioxane	

Comments

Signature

Paul Kaczk

Date

6/20/16

The graph illustrates the relationship between the Foot of Water in Well (Y-axis, 0 to 32) and Gallons of Water in Well (X-axis, 0 to 10). The curves represent different well diameters (ID): 1", 1 1/4", 1 1/2", 2", 2 1/2", 3", 4", and 6". The curves show that the foot of water increases as the gallons of water in the well increase, and the rate of increase is higher for smaller well diameters.

Volume / Linear Ft. of Pipe	Volume / Linear Ft. of Pipe	
	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0407	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

15 ft = 37.1 L / 9.8 G  
20 ft = 49.4 L / 13.1 G  
25 ft = 61.8 L / 16.3 G  
30 ft = 74.3 L / 19.6 G  
40 ft = 99.2 L / 26.1 G  
50 ft = 123.6 L / 32.6 G

RE 12902

[illegible]



**RESOLUTION  
CONSULTANTS**

Well ID: RE12901

## Low Flow Ground Water Sample Collection Record

Client: Navy NWIRP Bethpage Date: 6/24/16 Time: Start 1130 am/pm  
Project No: 60266526 Finish            am/pm  
Site Location: White Birch  
Weather Conds: Sunny 85° Collector(s): PK

### 1. WATER LEVEL DATA: (measured from Top of Casing)

a. Total Well Length 715 c. Length of Water Column            (a-b) Casing Diameter/Material  
b. Water Table Depth 26.87 d. Calculated System Volume (see back) 131 gal 20ft screen  
4-inch PVC 20ft screen

### 2. WELL PURGE DATA

a. Purge Method: Geotech bladder pump with drop tube assembly  
b. Acceptance Criteria defined (see workplan)  
- Temperature  $\pm 3\%$  - Turbidity  $\pm 10\%$  - D.O.  $\pm 10\%$  (values  $>0.5$  mg/L)  
- pH  $\pm 0.1$  unit - ORP  $\pm 10$  mV  
- Sp. Cond.  $\pm 3\%$  - Drawdown  $< 0.3'$  Remove a minimum 1 screen volume

c. Field Testing Equipment used:

Make	Model	Serial Number
YSI	556	78660
LaMotte Hanna	2020	6366

Time (24hr)	Volume Removed (Liters)	Temp. (°C)	pH	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1200	64								26.48	
1210		18.39	5.03	0.036	4.90	126.1	29.1	600		
1215		18.09	4.58	0.037	4.23	152.4	28.1	600	26.32	
1220		18.06	4.73	0.037	1.51	142.6				
1225		17.93	4.68	0.033	1.35	134.7	13.4		26.32	
1230	5921	17.86	4.66	0.031	1.27	129.8		600		

d. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If no or N/A - Explain below.

(continued on back)

### 3. SAMPLE COLLECTION:

Method: Geotech bladder pump with drop tube assembly

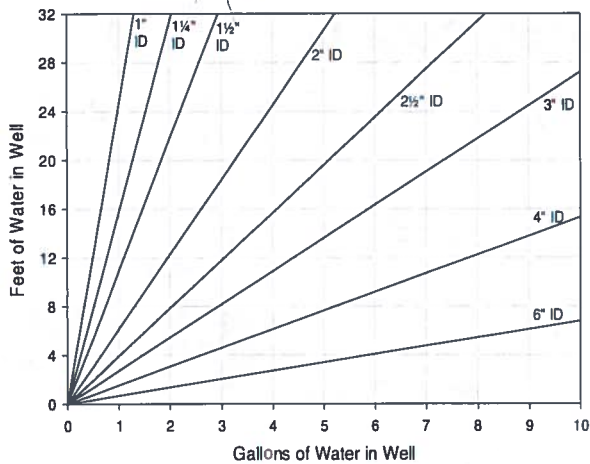
Sample ID	Container Type	No. of Containers	Preservation	Analysis Req.	Time
<del>RE12901-GW-062416</del>	<del>40 mL vials</del>	<del>3</del>	<del>HCl</del>	<del>VOCs</del>	
RE12901-GW-062416	1-L amber	2	none	1,4-Dioxane	1320

Comments: Resample for 1,4-Dioxane only (late FedEx shipment), VOCs  
collected on 6/20/16

Signature: Paul Kautz Date: 6/24/16



### Purge Volume Calculation



Volume / Linear Ft. of Pipe		
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

One screen volume  
(4-inch well)

15 ft = 37.1 L / 9.8 G  
20 ft = 49.4 L / 13.1 G  
25 ft = 61.8 L / 16.3 G  
30 ft = 74.3 L / 19.6 G  
40 ft = 99.2 L / 26.1 G  
50 ft = 123.6 L / 32.6 G

Well ID: RE12901 @ 1200

(continued from front)

[illegible]



Well ID: RE129DZ**Low Flow Ground Water Sample Collection Record**

Client: Navy NWIRP Bethpage Date: 6/24/16 Time: Start 1150 am/pm  
Project No: 60266526 Finish \_\_\_\_\_ am/pm  
Site Location: \_\_\_\_\_  
Weather Conds: \_\_\_\_\_ Collector(s): SC

**1. WATER LEVEL DATA: (measured from Top of Casing)**

a. Total Well Length 830 c. Length of Water Column \_\_\_\_\_ (a-b) Casing Diameter/Material 4-inch PVC  
b. Water Table Depth 26.36 d. Calculated System Volume (see back) 13.1 gal 2015 sec

**2. WELL PURGE DATA**

a. Purge Method: Geotech bladder pump with drop tube assembly

b. Acceptance Criteria defined (see workplan)

- Temperature  $\pm 3\%$  - Turbidity  $\pm 10\%$  - D.O.  $\pm 10\%$  (values  $>0.5$  mg/L)  
- pH  $\pm 0.1$  unit - ORP  $\pm 10$  mV  
- Sp. Cond.  $\pm 3\%$  - Drawdown  $< 0.3'$  Remove a minimum 1 screen volume

c. Field Testing Equipment used:

Make	Model	Serial Number
YSI	556	82546
<del>Carroll</del> Hanna	2020	63616

Time (24hr)	Volume Removed (Liters)	Temp. (°C)	pH	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1205		17.60	1.91	0.026	1.40	198.8	~	700	26.36	cloudy / none
1210		17.41	2.25	0.026	1.04	192.8	29.1	700	26.36	"
1215		17.06	2.56	0.024	0.88	186.9	—	700	26.36	"
1220	5 gal	16.92	3.04	0.024	0.84	173.2	14.7	700	26.36	"
1225		16.78	3.11	0.024	0.70	164.9	—	700	26.36	"
1235		16.69	3.36	0.024	0.58	152.6	13.9	700	26.39	"

d. Acceptance criteria pass/fail

Has required volume been removed

Yes No N/A

Has required turbidity been reached

Have parameters stabilized

If no or N/A - Explain below.

(continued on back)

**3. SAMPLE COLLECTION:**

Method: Geotech bladder pump with drop tube assembly

Sample ID	Container Type	No. of Containers	Preservation	Analysis Req.	Time
<u>RE129DZ-GW-062416</u>	<u>40-mL vials</u>	<u>2</u>	<u>HOT</u>	<u>VOGs</u>	
	<u>1-L amber</u>	<u>2</u>	<u>none</u>	<u>1,4-Dioxane</u>	<u>1310</u>

Comments

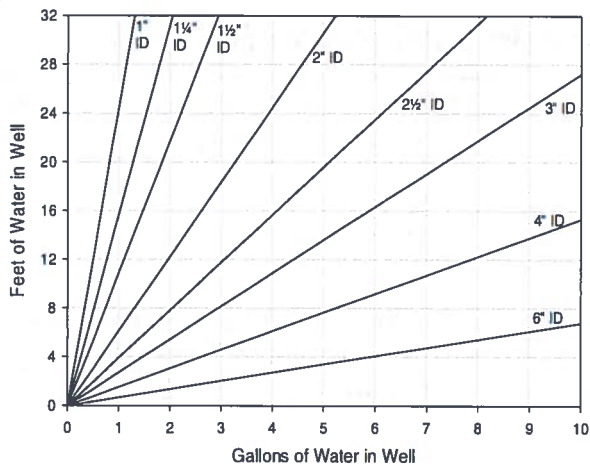
resample for 1,4 Dioxane only (Fedex late shipment) VOgs  
collected on 6/24/16

Signature

Date

6/24/16

### Purge Volume Calculation



Volume / Linear Ft. of Pipe		
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

One screen volume  
(4-inch well)

15 ft = 37.1 L / 9.8 G  
20 ft = 49.4 L / 13.1 G  
25 ft = 61.8 L / 16.3 G  
30 ft = 74.3 L / 19.6 G  
40 ft = 99.2 L / 26.1 G  
50 ft = 123.6 L / 32.6 G

Well ID:

RE12902

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[illegible]

## Section 5

### Analytical Data Validation

[Attachment D of the Data Validation report for the June 2016 Quarterly Sampling included here contains only results tables for RE129D1 and RE129D2; for the complete June 2016 Quarterly Sampling Data Validation report with all well results tables, see June *2016 Groundwater Sampling Data Summary Report, Bethpage, NY*, Resolution Consultants, 2016.]

## DATA VALIDATION REPORT

Project:	Regional Groundwater Investigation — NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Sample Delivery Group:	BETHPAGE-6	
Analyses/Method:	Volatile Organic Compounds by U.S. EPA SW-846 Method 8260C and 1,4-Dioxane by U.S. EPA SW-846 Method 8270D via Selective Ion Monitoring (SIM)	
Validation Level:	3	
Project Number:	0888812477.SA.DV	
Prepared by:	Dana Miller/Resolution Consultants	Completed on: 08/24/2016
Reviewed by:	Tina Clemmey/Resolution Consultants	File Name: BETHPAGE 6_8260C_8270D

## SUMMARY

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage Site on 20 to 27 June 2016 in accordance with the following Sampling and Analysis Plans:

- *Sampling and Analysis Plan, Bethpage, New York.* (Resolution Consultants, April 2013).
- *UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York.* (Resolution Consultants, November 2013).
- *UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York.* (Resolution Consultants, August 2014).

Sample ID	Matrix/Sample Type	Analysis
TB1-WQ-062116	Trip Blank	8260C
RE104D1-GW-062116	Groundwater	8260C/8270D_SIM
RE104D2-GW-062116	Groundwater	8260C/8270D_SIM
RE104D3-GW-062116	Groundwater	8260C/8270D_SIM
TT101D-GW-062116	Groundwater	8260C/8270D_SIM
TT101D1-GW-062116	Groundwater	8260C/8270D_SIM
TT101D2-GW-062116	Groundwater	8260C/8270D_SIM
DUP1-GW-062116	Field duplicate of TT101D1-GW-062116	8260C/8270D_SIM
RE123D1-GW-062016	Groundwater	8260C/8270D_SIM
RE123D2-GW-062016	Groundwater	8260C/8270D_SIM
RE123D3-GW-062016	Groundwater	8260C/8270D_SIM
RE129D1-GW-062016	Groundwater	8260C/8270D_SIM

Sample ID	Matrix/Sample Type	Analysis
RE129D2-GW-062016	Groundwater	8260C/8270D_SIM
RE126D1-GW-062116	Groundwater	8260C/8270D_SIM
RE126D2-GW-062116	Groundwater	8260C/8270D_SIM
RE126D3-GW-062116	Groundwater	8260C/8270D_SIM
TB2-WQ-062316	Trip Blank	8260C
RE103D2-GW-062316	Groundwater	8260C/8270D_SIM
RE103D3-GW-062316	Groundwater	8260C/8270D_SIM
DUP2-GW-062316	Field duplicate of RE103D3-GW-062316	8260C/8270D_SIM
RE131D1-GW-062316	Groundwater	8260C/8270D_SIM
RE131D2-GW-062316	Groundwater	8260C/8270D_SIM
RE131D3-GW-062316	Groundwater	8260C/8270D_SIM
RE122D1-GW-062216	Groundwater	8260C/8270D_SIM
RE122D2-GW-062216	Groundwater	8260C/8270D_SIM
RE122D3-GW-062216	Groundwater	8260C/8270D_SIM
RE120D1-GW-062216	Groundwater	8260C/8270D_SIM
RE120D2-GW-062216	Groundwater	8260C/8270D_SIM
RE120D3-GW-062216	Groundwater	8260C/8270D_SIM
FB1-WQ-062216	Field Blank	8260C/8270D_SIM
RE103D1-GW-062316	Groundwater	8260C/8270D_SIM
TB3-WQ-062416	Trip Blank	8260C
RE108D1-GW-062716	Groundwater	8260C/8270D_SIM
RE108D2-GW-062716	Groundwater	8260C/8270D_SIM
RE105D1-GW-062716	Groundwater	8260C/8270D_SIM
RE105D2-GW-062716	Groundwater	8260C/8270D_SIM
FB2-WQ-062716	Field Blank	8260C/8270D_SIM

Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 8260C, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (United States Environmental Protection Agency [U.S. EPA] 2006), *SW-846 Method 8270D, Semi volatile Organic Compounds by Gas Chromatograph/Mass Spectrometry* (U.S. EPA 2007), *U.S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (U.S. EPA, June 2008), and *Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2* (October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements, and/or professional judgment were used as appropriate.

## REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody)/sample integrity
- ✓ Holding times and sample preservation
- ✓ Gas chromatography/Mass spectrometer performance checks
- X Initial calibration (ICAL) /initial calibration verification (ICV)/continuing calibration verification (CCV)
- X Laboratory blanks/trip blanks/field blanks
- X Surrogate spike recoveries
- X Matrix spike (MS) and/or matrix spike duplicate (MSD) results
- ✓ Laboratory control sample/laboratory control sample duplicate results
- ✓ Field duplicates
- ✓ Internal standards
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. Acceptable data parameters for which all criteria were met, no qualification was performed, and/or non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further. The symbol (X) indicates that a QC non-conformance resulted in the qualification of data. Any QC non-conformance that resulted in the qualification of data is discussed below.

## RESULTS

### Initial Calibration/Continuing Calibration Verification

The ICAL is evaluated to ensure that the instrument was capable of producing acceptable quantitative data prior to the analysis of samples. The ICV is evaluated to assess the accuracy of ICAL standards. The CCV is evaluated to determine whether the instrument was within acceptable calibration throughout the period in which the samples were analyzed. Failure of the CCV indicates that the ICAL is no longer valid and should trigger recalibration and reanalysis of the associated samples in the analytical sequence.

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- The ICAL percent relative standard deviation, correlation coefficient/coefficient of determination, and/or response factor method acceptance criteria were met
- The ICV standard percent recovery acceptance criteria were met

- The CCV method percent difference or percent drift and response factor acceptance criteria were met
- The retention time method acceptance criteria were met

Data qualification to the analytes associated with the specific ICAL was as follows:

ICAL Linearity Non-conformance:

Criteria	Actions	
	Detected Results	Non-detected Results
%RSD >15% and quantitation based on mean response factor	J	UJ

Notes:

%RSD = Relative standard deviation  
J = Estimated  
UJ = Undetected and estimated

Data qualification to the analytes associated with the specific ICV was as follows:

ICV Recovery Non-conformance:

Criteria	Actions	
	Detected Results	Non-detected Results
Recovery >120%	J	UJ
Recovery < 80%	J	UJ

Notes:

J = Estimated  
UJ = Undetected and estimated

Data qualification to the analytes associated with the specific CCV was as follows:

CCV Linearity Non-conformance:

Criteria	Actions	
	Detected Results	Non-detected Results
%Difference or %Drift > 20%	J	UJ

Notes:

J = Estimated  
UJ = Undetected and estimated

ICAL, ICV and CCV non-conformances are summarized in Attachment A in Tables A-1, A-2, and A-3.

### Laboratory Blanks/Equipment Blanks/ Field Blanks/Trip Blanks

Laboratory blanks, equipment blanks, and trip blanks were analyzed with samples to assess contamination imparted by sample preparation and/or analysis. All results associated with a particular blank were evaluated to determine whether there was an inherent variability in the data, or if a problem was an isolated occurrence that did not affect the data. Samples were flagged in accordance with *Functional Guidelines* (shown below) where detections were not believed to be site-related.

### Blank Non-conformance Charts:

For common lab contaminants (methylene chloride, acetone, 2-butanone):			
Blank type	Blank result	Sample result	Action for samples
Method, Storage, Trip, Field, or Equipment	Detects	Not detected	No qualification
	≤ 2x LOQ	< 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and ≤ 4x the LOQ	Report the sample result with a U**
		≥ 4x the LOQ	No qualifications
	> 2x LOQ	< LOD	Report sample LOD value with a U**
		≥ LOD and < 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and < blank contamination	Report the blank result with a U or reject the sample result as unusable R
		≥ 2x LOQ and ≥ blank contamination	If the result is ≤2x blank result, report the sample result U.** If the result is > 2x blank result, no qualification is required. **
**Based on Resolution Consultants professional judgment			

<b>For all other compounds:</b>			
Blank type	Blank result	Sample result	Action for samples
Method, Storage, Trip, Field, or Equipment	Detects	Not detected	No qualification
	$< 2x$ LOQ	$< 2x$ LOQ	Report sample LOQ value with a U
		$\geq 2x$ LOQ	Use professional judgment
	$> 2x$ LOQ	$< 2x$ LOQ	Report sample LOQ value with a U
		$\geq 2x$ LOQ and $<$ blank contamination	Report the blank result with a U or reject the sample result as unusable R
		$\geq 2x$ LOQ and $\geq$ blank contamination	If the result is $\leq 2x$ blank result, report the sample result U. If the result is $> 2x$ blank result, no qualification is required.
	$= 2x$ LOQ	$< 2x$ LOQ	Report sample LOQ value with a U
		$\geq 2x$ LOQ	Use professional judgment
	Gross contamination	Detects	Qualify results as unusable R

### Notes:

LOQ = Limit of quantitation  
LOD = Limit of detection

U = Undetected  
R = Rejected



Blank non-conformances are summarized in Attachment A in Table A-4.

### Surrogate Spike Recoveries

Surrogates provide information needed to assess the accuracy of analyses. Known amounts of surrogate compounds, or compounds which are not likely to be found in the actual samples, are added to each organic sample to check for accuracy. If surrogate percent recoveries (%Rs) are close to the known concentrations, the reported target compound concentrations are assumed to be accurate. Data qualification on the basis of surrogate recovery was as follows:

### Surrogate Recovery Non-conformance Chart:

Criteria	Action	
	Detected	Non-detected
% R > Upper Limit	J	No qualification
20% ≤ %R < Lower Limit	J	UJ
% R < 20%	J	Rejected

#### Notes:

%R = Percent recovery  
J = Estimated  
UJ = Undetected and estimated

Surrogate recovery non-conformance is summarized in Attachment A in Table A-5.

### Matrix Spike/Matrix Spike Duplicate Results

MS/MSDs are generated to provide information about the effect of each sample matrix on the sample preparation and the measurement methodology. MS/MSD percent recoveries (%Rs) assess the effect of the sample matrix on the accuracy of the analytical results and %Rs above the laboratory control limit could indicate a potential high result bias while %Rs below QC limits could indicate a potential low result bias. The relative percent differences (RPDs) between the MS and MSD results are evaluated to assess sample precision. The MS/MSD %Rs and RPDs were reviewed for conformance with the QC acceptance criteria. Data qualification to the analytes associated with the specific MS/MSD non-conformances were as follows:

### MS/MSD Non-conformances Chart:

Criteria	Action	
	Detected Compounds	Non-detected Compounds
%R>Upper Limit	J	No qualification
20% ≤ %R < Lower Limit	J	UJ
%R <20%	J	Rejected

*Notes:*

%R	=	Percent recovery
RPD	=	Relative percent difference
J	=	Estimated
UJ	=	Undetected and estimated

MS/MSD %R non-conformances are summarized in Attachment A in Table A-6.

### Qualifications Actions

The data were reviewed independently from the laboratory to assess data quality. All compounds detected at concentrations less than the limit of quantitation but greater than the method detection limit were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation. Any sample that was analyzed at a dilution because of high concentrations of target or non-target analytes was checked to confirm that the results and/or sample-specific limit of quantitation and limit of detections were adjusted accordingly by the laboratory.

No results were rejected; therefore, analytical completeness was calculated to be 100 percent. Data not qualified during data review are considered usable by the project. The remaining results qualified as estimated may be high or low, but the data are usable for their intended purpose, according to U.S. EPA and Department of Defense guidelines. Final data review qualifiers used to describe results and how they should be interpreted by the end data user are provided in Attachment B and Attachment C. Attachment D provides final results after data review. Attachment E provides Katahdin Analytical Corrective Actions Report.

### ATTACHMENTS

Attachment A: Non-Conformance Summary Tables

Attachment B: Qualifier Codes and Explanations

Attachment C: Reason Codes and Explanations

Attachment D: Final Results after Data Review

Attachment A  
Non-Conformance Summary Table

Table A-1 Initial Calibration Non-Conformance							
Method	Analyte	Instrument Calibration Date	%RSD	Limit	Associated Samples	Lab ID	Qualifier
8260C	Acetone	6/21/2016	20.0645	<15%	DUP1-GW-062116	SJ4579-16	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	DUP2-GW-062316	SJ4670-12	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	FB2-WQ-062716	SJ4749-9	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE103D1-GW-062316	SJ4670-9	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE103D2-GW-062316	SJ4670-10	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE103D3-GW-062316	SJ4670-11	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE104D1-GW-062116	SJ4579-10	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE104D2-GW-062116	SJ4579-11	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE104D3-GW-062116	SJ4579-12	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE105D1-GW-062716	SJ4749-7	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE105D2-GW-062716	SJ4749-8DL	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE108D1-GW-062716	SJ4749-10	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE108D2-GW-062716	SJ4749-11DL	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE120D1-GW-062216	SJ4670-5	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE120D2-GW-062216	SJ4670-6	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE120D3-GW-062216	SJ4670-7	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE122D1-GW-062216	SJ4670-2	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE122D2-GW-062216	SJ4670-3	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE122D3-GW-062216	SJ4670-4	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE123D1-GW-062016	SJ4579-2	Detect: J
8260C	Acetone	6/21/2016	20.0645	<15%	RE123D2-GW-062016	SJ4579-3	Detect: J
8260C	Acetone	6/21/2016	20.0645	<15%	RE123D3-GW-062016	SJ4579-4	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE126D1-GW-062116	SJ4579-7	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE126D2-GW-062116	SJ4579-8	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE126D3-GW-062116	SJ4579-9	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE129D1-GW-062016	SJ4579-5	Detect: J
8260C	Acetone	6/21/2016	20.0645	<15%	RE129D2-GW-062016	SJ4579-6	Detect: J
8260C	Acetone	6/21/2016	20.0645	<15%	RE131D2-GW-062316	SJ4670-14	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	RE131D3-GW-062316	SJ4670-15	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	TB1-WQ-062116	SJ4579-1	Detect: J
8260C	Acetone	6/21/2016	20.0645	<15%	TB3-WQ-062416	SJ4749-1	Detect: J
8260C	Acetone	6/21/2016	20.0645	<15%	TT101D1-GW-062116	SJ4579-14	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	TT101D2-GW-062116	SJ4579-15	Non-detect: UJ
8260C	Acetone	6/21/2016	20.0645	<15%	TT101D-GW-062116	SJ4579-13	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	DUP1-GW-062116	SJ4579-16	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	DUP2-GW-062316	SJ4670-12	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	FB2-WQ-062716	SJ4749-9	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE103D1-GW-062316	SJ4670-9	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE103D2-GW-062316	SJ4670-10	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE103D3-GW-062316	SJ4670-11	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE104D1-GW-062116	SJ4579-10	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE104D2-GW-062116	SJ4579-11	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE104D3-GW-062116	SJ4579-12	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE105D1-GW-062716	SJ4749-7	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE105D2-GW-062716	SJ4749-8DL	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE108D1-GW-062716	SJ4749-10	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE108D2-GW-062716	SJ4749-11DL	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE120D1-GW-062216	SJ4670-5	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE120D2-GW-062216	SJ4670-6	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE120D3-GW-062216	SJ4670-7	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE122D1-GW-062216	SJ4670-2	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE122D2-GW-062216	SJ4670-3	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE122D3-GW-062216	SJ4670-4	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE123D1-GW-062016	SJ4579-2	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE123D2-GW-062016	SJ4579-3	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE123D3-GW-062016	SJ4579-4	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE126D1-GW-062116	SJ4579-7	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE126D2-GW-062116	SJ4579-8	Non-detect: UJ

Table A-1 Initial Calibration Non-Conformance							
Method	Analyte	Instrument Calibration Date	%RSD	Limit	Associated Samples	Lab ID	Qualifier
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE126D3-GW-062116	SJ4579-9	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE129D1-GW-062016	SJ4579-5	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE129D2-GW-062016	SJ4579-6	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE131D2-GW-062316	SJ4670-14	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	RE131D3-GW-062316	SJ4670-15	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	TB1-WQ-062116	SJ4579-1	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	TB3-WQ-062416	SJ4749-1	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	TT101D1-GW-062116	SJ4579-14	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	TT101D2-GW-062116	SJ4579-15	Non-detect: UJ
8260C	1,4-Dichlorobenzene	6/21/2016	15.17018	<15%	TT101D-GW-062116	SJ4579-13	Non-detect: UJ
8260C	Chloroethane	6/27/2016	15.12902	<15%	FB1-WQ-062216	SJ4670-8	Non-detect: UJ
8260C	Chloroethane	6/27/2016	15.12902	<15%	RE131D1-GW-062316	SJ4670-13	Non-detect: UJ
8260C	Chloroethane	6/27/2016	15.12902	<15%	TB2-WQ-062316	SJ4670-1	Non-detect: UJ
8260C	Acetone	6/27/2016	19.00968	<15%	FB1-WQ-062216	SJ4670-8	Detect: J
8260C	Acetone	6/27/2016	19.00968	<15%	RE131D1-GW-062316	SJ4670-13	Non-detect: UJ
8260C	Acetone	6/27/2016	19.00968	<15%	TB2-WQ-062316	SJ4670-1	Detect: J

*Notes:*

%RSD = Relative standard deviation  
 UJ = Non-detect estimated value  
 J = Estimated value

Table A-2 Initial Calibration Verification Non-Conformance							
Method	Analyte	ICV ID	%R	Limit	Associated Samples	Lab ID	Qualifier
8260C	Bromomethane	P6095.D	127.02	80-120	DUP1-GW-062116	SJ4579-16	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	DUP2-GW-062316	SJ4670-12	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	FB2-WQ-062716	SJ4749-9	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE103D1-GW-062316	SJ4670-9	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE103D2-GW-062316	SJ4670-10	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE103D3-GW-062316	SJ4670-11	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE104D1-GW-062116	SJ4579-10	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE104D2-GW-062116	SJ4579-11	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE104D3-GW-062116	SJ4579-12	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE105D1-GW-062716	SJ4749-7	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE105D2-GW-062716	SJ4749-8DL	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE108D1-GW-062716	SJ4749-10	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE108D2-GW-062716	SJ4749-11DL	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE120D1-GW-062216	SJ4670-5	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE120D2-GW-062216	SJ4670-6	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE120D3-GW-062216	SJ4670-7	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE122D1-GW-062216	SJ4670-2	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE122D2-GW-062216	SJ4670-3	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE122D3-GW-062216	SJ4670-4	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE123D1-GW-062016	SJ4579-2	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE123D2-GW-062016	SJ4579-3	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE123D3-GW-062016	SJ4579-4	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE126D1-GW-062116	SJ4579-7	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE126D2-GW-062116	SJ4579-8	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE126D3-GW-062116	SJ4579-9	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE129D1-GW-062016	SJ4579-5	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE129D2-GW-062016	SJ4579-6	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE131D2-GW-062316	SJ4670-14	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	RE131D3-GW-062316	SJ4670-15	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	TB1-WQ-062116	SJ4579-1	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	TB3-WQ-062416	SJ4749-1	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	TT101D1-GW-062116	SJ4579-14	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	TT101D2-GW-062116	SJ4579-15	Non-detect: UJ
8260C	Bromomethane	P6095.D	127.02	80-120	TT101D-GW-062116	SJ4579-13	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	DUP1-GW-062116	SJ4579-16	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	DUP2-GW-062316	SJ4670-12	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	FB2-WQ-062716	SJ4749-9	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE103D1-GW-062316	SJ4670-9	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE103D2-GW-062316	SJ4670-10	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE103D3-GW-062316	SJ4670-11	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE104D1-GW-062116	SJ4579-10	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE104D2-GW-062116	SJ4579-11	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE104D3-GW-062116	SJ4579-12	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE105D1-GW-062716	SJ4749-7	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE105D2-GW-062716	SJ4749-8DL	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE108D1-GW-062716	SJ4749-10	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE108D2-GW-062716	SJ4749-11DL	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE120D1-GW-062216	SJ4670-5	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE120D2-GW-062216	SJ4670-6	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE120D3-GW-062216	SJ4670-7	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE122D1-GW-062216	SJ4670-2	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE122D2-GW-062216	SJ4670-3	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE122D3-GW-062216	SJ4670-4	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE123D1-GW-062016	SJ4579-2	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE123D2-GW-062016	SJ4579-3	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE123D3-GW-062016	SJ4579-4	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE126D1-GW-062116	SJ4579-7	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE126D2-GW-062116	SJ4579-8	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE126D3-GW-062116	SJ4579-9	Non-detect: UJ

Table A-2 Initial Calibration Verification Non-Conformance							
Method	Analyte	ICV ID	%R	Limit	Associated Samples	Lab ID	Qualifier
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE129D1-GW-062016	SJ4579-5	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE129D2-GW-062016	SJ4579-6	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE131D2-GW-062316	SJ4670-14	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	RE131D3-GW-062316	SJ4670-15	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	TB1-WQ-062116	SJ4579-1	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	TB3-WQ-062416	SJ4749-1	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	TT101D1-GW-062116	SJ4579-14	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	TT101D2-GW-062116	SJ4579-15	Non-detect: UJ
8260C	Carbon Disulfide	P6095.D	140.15	80-120	TT101D-GW-062116	SJ4579-13	Non-detect: UJ
8260C	Carbon Disulfide	W6632A.D	176.92	80-120	FB1-WQ-062216	SJ4670-8	Non-detect: UJ
8260C	Carbon Disulfide	W6632A.D	176.92	80-120	RE131D1-GW-062316	SJ4670-13	Non-detect: UJ
8260C	Carbon Disulfide	W6632A.D	176.92	80-120	TB2-WQ-062316	SJ4670-1	Non-detect: UJ
8260C	Acetone	W6632A.D	150.29	80-120	FB1-WQ-062216	SJ4670-8	Detect: J
8260C	Acetone	W6632A.D	150.29	80-120	RE131D1-GW-062316	SJ4670-13	Non-detect: UJ
8260C	Acetone	W6632A.D	150.29	80-120	TB2-WQ-062316	SJ4670-1	Detects: J
8260C	Cyclohexane	W6632A.D	125.34	80-120	FB1-WQ-062216	SJ4670-8	Non-detect: UJ
8260C	Cyclohexane	W6632A.D	125.34	80-120	RE131D1-GW-062316	SJ4670-13	Non-detect: UJ
8260C	Cyclohexane	W6632A.D	125.34	80-120	TB2-WQ-062316	SJ4670-1	Non-detect: UJ

*Notes:*

ICV ID = Initial calibration verification identification  
ID = Identification  
%R = Percent recovery  
UJ = Non-detect estimated value  
J = Estimated value

Table A-3 Continuing Calibration Verification Non-Conformance						
Lab ID/ Lab File ID	Analyte	%D	%D Limit	Associated Samples	Lab ID	Qualifier
WG186222-4/P6203.D	Bromomethane	22.30338	+/- 20%	FB2-WQ-062716	SJ4749-9	Non-detect: UJ
WG186222-4/P6203.D	Bromomethane	22.30338	+/- 20%	RE105D1-GW-062716	SJ4749-7	Non-detect: UJ
WG186222-4/P6203.D	Bromomethane	22.30338	+/- 20%	RE105D2-GW-062716	SJ4749-8DL	Non-detect: UJ
WG186222-4/P6203.D	Bromomethane	22.30338	+/- 20%	RE108D1-GW-062716	SJ4749-10	Non-detect: UJ
WG186222-4/P6203.D	Bromomethane	22.30338	+/- 20%	RE108D2-GW-062716	SJ4749-11DL	Non-detect: UJ
WG186222-4/P6203.D	Bromomethane	22.30338	+/- 20%	TB3-WQ-062416	SJ4749-1	Non-detect: UJ
WG186222-4/P6203.D	Carbon Disulfide	26.30299	+/- 20%	FB2-WQ-062716	SJ4749-9	Non-detect: UJ
WG186222-4/P6203.D	Carbon Disulfide	26.30299	+/- 20%	RE105D1-GW-062716	SJ4749-7	Non-detect: UJ
WG186222-4/P6203.D	Carbon Disulfide	26.30299	+/- 20%	RE105D2-GW-062716	SJ4749-8DL	Non-detect: UJ
WG186222-4/P6203.D	Carbon Disulfide	26.30299	+/- 20%	RE108D1-GW-062716	SJ4749-10	Non-detect: UJ
WG186222-4/P6203.D	Carbon Disulfide	26.30299	+/- 20%	RE108D2-GW-062716	SJ4749-11DL	Non-detect: UJ
WG186222-4/P6203.D	Carbon Disulfide	26.30299	+/- 20%	TB3-WQ-062416	SJ4749-1	Non-detect: UJ
WG186134-4/W6650.D	Acetone	-23.43794	+/- 20%	FB1-WQ-062216	SJ4670-8	Detect: J
WG186134-4/W6650.D	Acetone	-23.43794	+/- 20%	TB2-WQ-062316	SJ4670-1	Detect: J

*Notes:*

ID = Identification  
%D = Percent difference  
UJ = Non-detect estimated value  
J = Detected estimated value



Table A-4 Blank Non-Conformance					
Blank ID	Lab ID	Analyte	Blank Result (ug/L)	Detected Associated Sample	Qualifier
TB1-WQ-062116	SJ4579-1	Acetone	3.7	RE104D3-GW-062116 RE126D1-GW-062116 RE126D2-GW-062116 TT101D2-GW-062116	U
TB2-WQ-062316	SJ4670-1	Acetone	5.6	RE103D1-GW-062316 RE103D3-GW-062316 RE131D1-GW-062316 RE131D2-GW-062316 RE131D3-GW-062316	U
TB3-WQ-062416	SJ4749-1	Acetone	4.5	RE105D1-GW-062716 RE108D1-GW-062716	U
WG186084-9	WG186084-9	Acetone	9.4	RE131D1-GW-062316	U

*Notes:*

ID = Identification  
ug/L = Micrograms per liter  
U = Non-detect value

Table A-5 Surrogate Non-Conformance						
Method	Sample ID	Batch	Surrogate	%R	Control Limit	Qualifier
8270D SIM	RE120D1-GW-062216	WG186087	1,4-Dioxane-d8	152	30-150	J

*Notes:*

SIM = Selected Ion Monitoring  
 ID = Identification  
 %R = Percent recovery  
 J = Detected estimated value

Table A-6 Matrix Spike/Matrix Spike Duplicate Percent Recovery Non-Conformance					
Sample ID	Analyte	MS %R	MSD %R	%R Limit	Qualifier
TT101D2-GW-062116	1,4-Dioxane	5.2	17.7	10-90	J

*Notes:*

ID = Identification  
 MS = Matrix spike  
 MSD = Matrix spike duplicate  
 %R = Percent recovery  
 J = Estimated value

Attachment B  
Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual quantitation limit necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

Attachment C  
Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
bm	Missing blank information
bt	Trip blank contamination
c	Calibration issue
cr	Chromatographic resolution
d	Reporting limit raised due to chromatographic interference
dt	Dissolved result > total over limit
e	Ether interference
ej	Above calibration range; result estimated.
f	Presumed contamination from FB or ER.
fd	Field duplicate RPDs
h	Holding times
hs	Headspace greater than 6mm in all sample vials
i	Internal standard areas
ii	Injection internal standard area or retention time exceedance
it	Instrument tune
k	Estimated maximum possible concentrations (EMPC)
l	LCS recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
mc	Deviation from the method
md	MS/MSD RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
p-h	Uncertainty near detection limit (< Reporting Limit), historical reason code applied.
pe	Post Extraction Spike
q	Quantitation issue
r	Dual column RPD
rt	SIM ions not within + 2 seconds
s	Surrogate recovery
sp	Sample preparation issue
su	Evidence of ion suppression
t	Temperature Preservation Issue
x	Low % solids
y	Serial dilution results
z	ICS results

Attachment D  
Final Results after Data Review



June 2016 2nd Quarter  
Final Results after Data Review  
NWIRP Bethpage OU 2 Regional Groundwater Investigation

			Lab ID Sample ID Sample Date Sample Type	SJ4579-5 RE129D1-GW-062016 * 6/20/2016 Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	0.5	U	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	1	U	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	UJ	c
8260C	2-BUTANONE	78-93-3	UG L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	U	
8260C	ACETONE	67-64-1	UG L	3.2	J	c
8260C	BENZENE	71-43-2	UG L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	U	
8260C	BROMOFORM	75-25-2	UG L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG L	1	UJ	c
8260C	CARBON DISULFIDE	75-15-0	UG L	0.5	UJ	c
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG L	1	U	
8260C	CHLOROFORM	67-66-3	UG L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG L	0.5	U	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG L	1	U	
8260C	ETHYLBENZENE	100-41-4	UG L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG L	1	U	
8260C	METHYL ACETATE	79-20-9	UG L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG L	2.5	U	
8260C	O-XYLENE	95-47-6	UG L	0.5	U	
8260C	STYRENE	100-42-5	UG L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG L	0.5	U	
8260C	TOLUENE	108-88-3	UG L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG L	0.5	U	
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG L	1.5	U	
8270D SIM	1,4-DIOXANE	123-91-1	UG L	0.17	U	

*Notes:*

- \* = 1,4-Dioxane results collected on 06/24/2016
- UG\_L = Micrograms per liter
- NA = Not applicable
- Qual = Final qualifiers (See Attachment A)
- RC = Reason codes (See Attachment B)

June 2016 2nd Quarter  
Final Results after Data Review  
NWIRP Bethpage OU 2 Regional Groundwater Investigation

			Lab ID Sample ID Sample Date Sample Type	SJ4579-6 RE129D2-GW-062016 * 6/20/2016 Groundwater		
Method	Analyte	CAS No	Units	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG L	0.5	U	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG L	1	U	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG L	0.5	UJ	c
8260C	2-BUTANONE	78-93-3	UG L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG L	2.5	U	
8260C	ACETONE	67-64-1	UG L	2.5	J	c
8260C	BENZENE	71-43-2	UG L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG L	0.5	U	
8260C	BROMOFORM	75-25-2	UG L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG L	1	UJ	c
8260C	CARBON DISULFIDE	75-15-0	UG L	0.5	UJ	c
8260C	CARBON TETRACHLORIDE	56-23-5	UG L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG L	1	U	
8260C	CHLOROFORM	67-66-3	UG L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG L	0.5	U	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG L	1	U	
8260C	ETHYLBENZENE	100-41-4	UG L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG L	1	U	
8260C	METHYL ACETATE	79-20-9	UG L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG L	2.5	U	
8260C	O-XYLENE	95-47-6	UG L	0.5	U	
8260C	STYRENE	100-42-5	UG L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG L	0.5	U	
8260C	TOLUENE	108-88-3	UG L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG L	0.5	U	
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG L	1.5	U	
8270D SIM	1,4-DIOXANE	123-91-1	UG L	0.17	U	

*Notes:*

- \* = 1,4-Dioxane results collected on 06/24/2016
- UG\_L = Micrograms per liter
- NA = Not applicable
- Qual = Final qualifiers (See Attachment A)
- RC = Reason codes (See Attachment B)

## DATA VALIDATION REPORT

Project:	Regional Groundwater Investigation — NWIRP Bethpage		
Laboratory:	Katahdin Analytical		
Sample Delivery Groups:	SJ1600		
Analyses/Method:	Total Organic Carbon (TOC) by U.S. EPA SW-846 Method 9060A and Standard Method 5310B for Total Organic Carbon by High-Temperature Combustion		
Validation Level:	2		
Project Number:	0888812477.SA.DV		
Prepared by:	Dana Miller/Resolution Consultants	Completed on: 03/28/2016	
Reviewed by:	Tina Cantwell/Resolution Consultants	File Name: SJ1600_ 9060A_5310B	

## SUMMARY

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage site on 8 March 2016 in accordance with the following Sampling and Analysis Plans:

- *Sampling and Analysis Plan, Bethpage, New York.* (Resolution Consultants April 2013).
- *UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York.* (Resolution Consultants November 2013).
- *UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York.* (Resolution Consultants August 2014).

Sample ID	Lab ID	Matrix/Sample Type	Analysis
RE129D2-SOIL-030816-808-810	SJ1600-1	Soil	9060A , 2540G
RE129D2-EB-030816	SJ1600-2	Equipment Blank	5310B

Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 9060A, Total Organic Carbon* (U.S. EPA, 1996), *Method SM5310B, Total Organic Carbon by High-Temperature Combustion*, *U.S. Environmental Protection Agency (U.S. EPA) Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (NFG, January 2010, and Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (October 2010). In

the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

## REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody)/sample integrity
- ✓ Holding times and sample preservation
- NA Gas chromatography/Mass spectrometer performance checks
- NA Initial calibration/continuing calibration verification
- ✗ Laboratory blanks/equipment blanks
- NA Surrogate spike recoveries
- NA Matrix spike and/or matrix spike duplicate results
- ✓ Laboratory control sample / laboratory control sample duplicate results
- NA Field duplicates
- NA Internal standards
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Acceptable data parameters for which all criteria were met and no qualification was performed, and non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further. The symbol (✗) indicates that a QC non-conformance resulted in the qualification of data. Any QC non-conformance that resulted in the qualification of data is discussed below.

### Laboratory Blanks/Equipment Blanks

Laboratory blanks and equipment blanks were analyzed with samples to assess contamination imparted by sample preparation and/or analysis. All results associated with a particular blank were evaluated to determine whether there was an inherent variability in the data, or if a problem was an isolated occurrence that did not affect the data. Samples were flagged in accordance with *Functional Guidelines* (shown below) where detections were not believed to be site-related.

Blank Non-conformance Charts:

For common lab contaminants (methylene chloride, acetone, 2-butanone):			
Blank type	Blank result	Sample result	Action for samples
Method, Storage, Trip, Field, or Equipment	Detects	Not detected	No qualification
	≤ 2x LOQ	< 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and ≤ 4x the LOQ	Report the sample result with a U**
		≥ 4x the LOQ	No qualifications
	> 2x LOQ	< LOD	Report sample LOD value with a U**
		≥ LOD and < 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and < blank contamination	Report the blank result with a U or reject the sample result as unusable R
		≥ 2x LOQ and ≥ blank contamination	If the result is ≤2x blank result, report the sample result U.** If the result is > 2x blank result, no qualification is required.**
**Based on Resolution Consultants professional judgment			

<b>For all other compounds:</b>			
Blank type	Blank result	Sample result	Action for samples
Method, Storage, Trip, Field, or Equipment	Detects	Not detected	No qualification
	$< 2x$ LOQ	$< 2x$ LOQ	Report sample LOQ value with a U
		$\geq 2x$ LOQ	Use professional judgment
	$> 2x$ LOQ	$< 2x$ LOQ	Report sample LOQ value with a U
		$\geq 2x$ LOQ and $<$ blank contamination	Report the blank result with a U or reject the sample result as unusable R
		$\geq 2x$ LOQ and $\geq$ blank contamination	If the result is $\leq 2x$ blank result, report the sample result U. If the result is $> 2x$ blank result, no qualification is required.
	$= 2x$ LOQ	$< 2x$ LOQ	Report sample LOQ value with a U
		$\geq 2x$ LOQ	Use professional judgment
	Gross contamination	Detects	Qualify results as unusable R

Notes:

LOQ	=	Limit of quantitation
LOD	=	Limit of detection
U	=	Undetected
R	=	Rejected

TOC was detected in the equipment blank but professional judgement was used not to qualify the associated sample as undetected. Lab blank non-conformances are summarized in Attachment A in Table A-1.

### Qualifications Actions

The data was reviewed independently from the laboratory to assess data quality. One sample was qualified as non-detect and estimated due to lab blank contamination. Data not qualified during data review are considered usable by the project for their intended purpose, according to U.S. EPA and Department of Defense guidelines. Final results after data review are provided in Attachment B.

### ATTACHMENTS

Attachment A: Non-Conformance Summary Table

Attachment B: Table B-1, Final Results after Data Review

Attachment A  
Non-Conformance Summary Table

Table A-1  
Lab Blank Non-Conformance

Blank	Batches	Method	Analyte	Blank Result (MG_L)	LOQ	Associated Samples	Detected Associated Sample Result (MG_L)	LOQ	Qualifier
WG180357-1	WG180357	5310B	TOTAL ORGANIC CARBON	0.13	1.0	RE129D2-EB-030816	0.26	1.0	UJ

*Notes:*

MG\_L = Milligrams per liter

LOQ = Limit of quantitation

UJ = The analyte was found in a sample at a concentration less than five times the blank concentration and qualified non-detect and estimated.



Attachment B  
Final Results after Data Review

Table B-1  
Final Results after Data Review  
Regional Groundwater Investigation NWIRP Bethpage

Sample Delivery Group				SJ1600			SJ1600		
Lab ID				SJ1600-1			SJ1600-2		
Sample ID				RE129D2-SOIL-030816-808-810			RE129D2-EB-030816		
Sample Date				3/8/2016			3/8/2016		
Matrix				Soil			Equipment Blank		
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC
2540G	TOTAL SOLIDS	-29	PCT	82			NA		
5310B	TOTAL ORGANIC CARBON	-28	MG_L	NA			0.5	UJ	bl
9060A	TOTAL ORGANIC CARBON	-28	UG_G	2600			NA		

*Notes:*

ID = Identification  
Qual = Final interpreted qualifier  
RC = Validator reason code (See definition below)  
PCT = Percent  
MG\_L = Milligrams per liter  
UG\_G = Micrograms per gram  
NA = Not analyzed  
UJ = Non-detect and estimated value

*Reason Code*

bl = Flagged non-detect and estimated due to lab blank contamination.

## DATA VALIDATION REPORT

Project:	Regional Groundwater Investigation — NWIRP Bethpage		
Laboratory:	Katahdin Analytical		
Sample Delivery Groups:	SJ2250		
Analyses/Method:	Total Organic Carbon (TOC) by U.S. EPA SW-846 Method 9060A and Standard Method 5310B for Total Organic Carbon by High-Temperature Combustion		
Validation Level:	2		
Project Number:	0888812477.SA.DV		
Prepared by:	Dana Miller/Resolution Consultants	Completed on: 04/27/2016	
Reviewed by:	Tina Cantwell/Resolution Consultants	File Name: SJ2250_ 9060A_5310B	

## SUMMARY

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage site on 4 April 2016 in accordance with the following Sampling and Analysis Plans:

- *Sampling and Analysis Plan, Bethpage, New York.* (Resolution Consultants April 2013).
- *UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York.* (Resolution Consultants November 2013).
- *UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York.* (Resolution Consultants August 2014).

Sample ID	Lab ID	Matrix/Sample Type	Analysis
RE129D1-SOIL-040416-693-695	SJ2250-1	Soil	9060A, 2540G
RE129D1-EB-040416	SJ2250-2	Equipment Blank	5310B

Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 9060A, Total Organic Carbon* (U.S. EPA, 1996), *Method SM5310B, Total Organic Carbon by High-Temperature Combustion, U.S. Environmental Protection Agency (U.S. EPA) Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (NFG, January 2010, and Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (October 2010). In

the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

## REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody)/sample integrity
- ✓ Holding times and sample preservation
- NA Gas chromatography/Mass spectrometer performance checks
- NA Initial calibration/continuing calibration verification
- ✗ Laboratory blanks/equipment blanks
- NA Surrogate spike recoveries
- ✓ Matrix spike and/or matrix spike duplicate results
- ✓ Laboratory control sample laboratory control sample duplicate results
- NA Field duplicates
- NA Internal standards
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Acceptable data parameters for which all criteria were met and no qualification was performed, and non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further. The symbol (✗) indicates that a QC non-conformance resulted in the qualification of data. Any QC non-conformance that resulted in the qualification of data is discussed below.

### Laboratory Blanks/Equipment Blanks

Laboratory blanks and equipment blanks were analyzed with samples to assess contamination imparted by sample preparation and/or analysis. All results associated with a particular blank were evaluated to determine whether there was an inherent variability in the data, or if a problem was an isolated occurrence that did not affect the data. Samples were flagged in accordance with *Functional Guidelines* (shown below) where detections were not believed to be site-related.

Blank Non-conformance Charts:

For common lab contaminants (methylene chloride, acetone, 2-butanone):			
Blank type	Blank result	Sample result	Action for samples
Method, Storage, Trip, Field, or Equipment	Detects	Not detected	No qualification
	≤ 2x LOQ	< 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and ≤ 4x the LOQ	Report the sample result with a U**
		≥ 4x the LOQ	No qualifications
	> 2x LOQ	< LOD	Report sample LOD value with a U**
		≥ LOD and < 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and < blank contamination	Report the blank result with a U or reject the sample result as unusable R
		≥ 2x LOQ and ≥ blank contamination	If the result is ≤2x blank result, report the sample result U.** If the result is > 2x blank result, no qualification is required.**
**Based on Resolution Consultants professional judgment			

<b>For all other compounds:</b>			
Blank type	Blank result	Sample result	Action for samples
Method, Storage, Trip, Field, or Equipment	Detects	Not detected	No qualification
	$< 2x$ LOQ	$< 2x$ LOQ	Report sample LOQ value with a U
		$\geq 2x$ LOQ	Use professional judgment
	$> 2x$ LOQ	$< 2x$ LOQ	Report sample LOQ value with a U
		$\geq 2x$ LOQ and $<$ blank contamination	Report the blank result with a U or reject the sample result as unusable R
		$\geq 2x$ LOQ and $\geq$ blank contamination	If the result is $\leq 2x$ blank result, report the sample result U. If the result is $> 2x$ blank result, no qualification is required.
	$= 2x$ LOQ	$< 2x$ LOQ	Report sample LOQ value with a U
		$\geq 2x$ LOQ	Use professional judgment
	Gross contamination	Detects	Qualify results as unusable R

Notes:

LOQ	=	Limit of quantitation
LOD	=	Limit of detection
U	=	Undetected
R	=	Rejected

TOC was detected in the equipment blank but professional judgement was used not to qualify the associated sample as undetected. Lab blank non-conformances are summarized in Attachment A in Table A-1.

### Qualifications Actions

The data was reviewed independently from the laboratory to assess data quality. One sample was qualified as non-detect and estimated due to lab blank contamination. Data not qualified during data review are considered usable by the project for their intended purpose, according to U.S. EPA and Department of Defense guidelines. Final results after data review are provided in Attachment B.

### ATTACHMENTS

Attachment A: Non-Conformance Summary Table

Attachment B: Table B-1, Final Results after Data Review

Attachment A  
Non-Conformance Summary Table

Table A-1  
Lab Blank Non-Conformance

Blank	Batches	Method	Analyte	Blank Result (MG_L)	LOQ	Associated Samples	Detected Associated Sample Result (MG_L)	LOQ	Qualifier
WG181665-1	WG181665	5310B	TOTAL ORGANIC CARBON	0.23	1.0	RE129D1-EB-040416	0.27	1.0	UJ

*Notes:*

MG\_L = Milligrams per liter

LOQ = Limit of quantitation

UJ = The analyte was found in a sample at a concentration less than five times the blank concentration and qualified non-detect and estimated.



Attachment B  
Final Results after Data Review

Table B-1  
Final Results after Data Review  
Regional Groundwater Investigation NWIRP Bethpage

Sample Delivery Group Lab ID Sample ID Sample Date Matrix				SJ2250 SJ2250-1 RE129D1-SOIL-040416-693-695 4/4/2016 Soil			SJ2250 SJ2250-2 RE129D1-EB-040416 4/4/2016 Equipment Blank		
Method	Analyte	CAS No	Units	Result	Qual	RC	Result	Qual	RC
2540G	TOTAL SOLIDS	-29	PCT	88			NA		
5310B	TOTAL ORGANIC CARBON	-28	MG_L	NA			0.5	UJ	bl
9060A	TOTAL ORGANIC CARBON	-28	UG_G						

*Notes:*

ID = Identification  
Qual = Final interpreted qualifier  
RC = Validator reason code (See definition below)  
PCT = Percent  
MG\_L = Milligrams per liter  
UG\_G = Micrograms per gram  
NA = Not analyzed  
UJ = Non-detect and estimated value

*Reason Code*

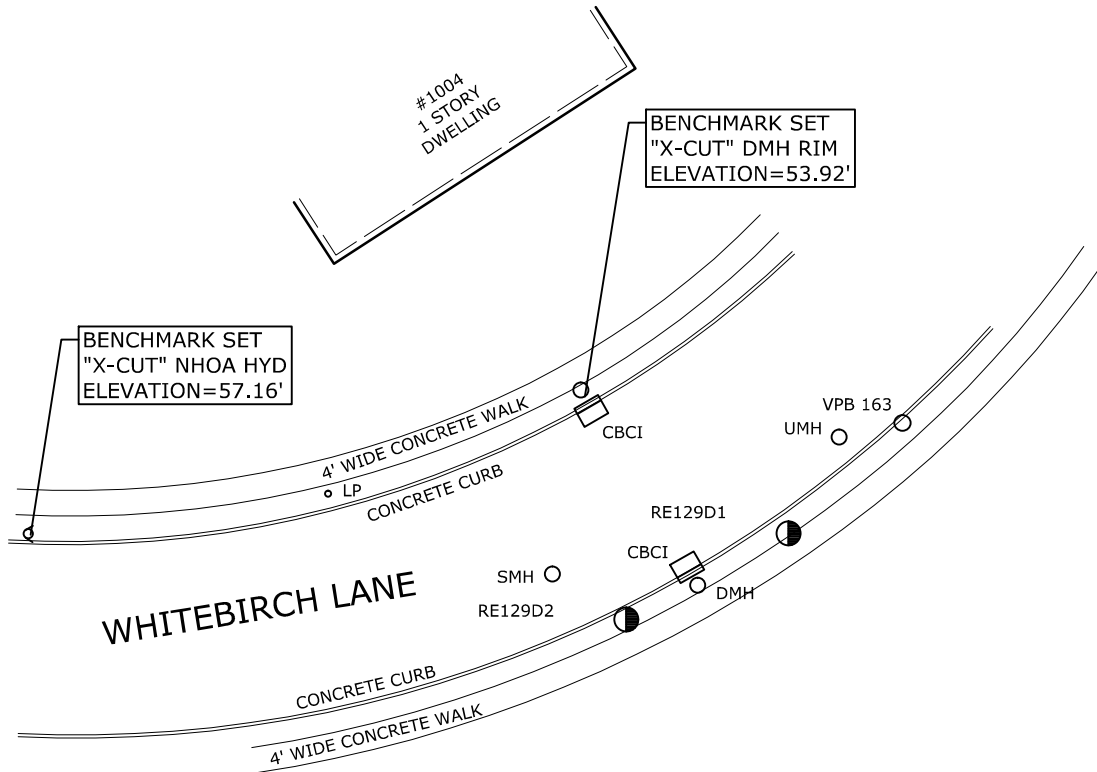
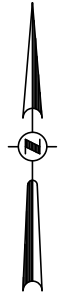
bl = Flagged non-detect and estimated due to lab blank contamination.

## Section 6

### Survey

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

Description	Northing	Easting	Latitude	Longitude	Ground	Rim	PVC
VPB 163	196103.89	1124117.34	N40-42-13.79	W73-29-43.96	53.94	NA	NA
RE129D1	196086.63	1124099.54	N40-42-13.62	W73-29-44.19	54.09	54.09	53.63
RE129D2	196073.15	1124074.20	N40-42-13.49	W73-29-44.52	53.96	53.96	53.52

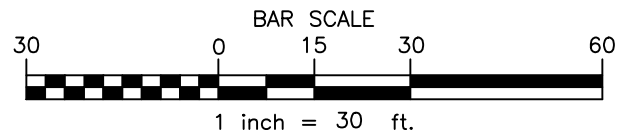


#### Legend

	CBCI	Catch Basin Curb Inlet
	DMH	Drainage Manhole
	LP	Light Pole
		Monitoring Well
	SMH	Sanitary Manhole
	UMH	Unknown Manhole
	VPB 163	Vertical Profile Boring

#### Map Notes

- Information shown hereon was compiled from an actual field survey conducted on April 27, 2016.
- North orientation is Grid North based on the New York State Plane Coordinate System, Long Island Zone, NAD 83(2011) epoch 2010.00 as obtained from GPS observations.
- Vertical datum shown hereon is NAVD 88(Geoid12A) as obtained from RTK GPS observations using the Queens CORS as a base station.



DWG NO.16-327

Date	RECORD OF WORK	Appr.	VERTICAL PROFILE BORING 163 SURVEY LOCATION 1004 WHITEBIRCH LANE	
TOWN OF HEMPSTEAD		NASSAU COUNTY, NEW YORK		
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Drafter: LMK Appr. by: JFC		Checker: JFC Proj. No. 14.4121		
SCALE: 1"=30'		DATE: APRIL 27, 2016		